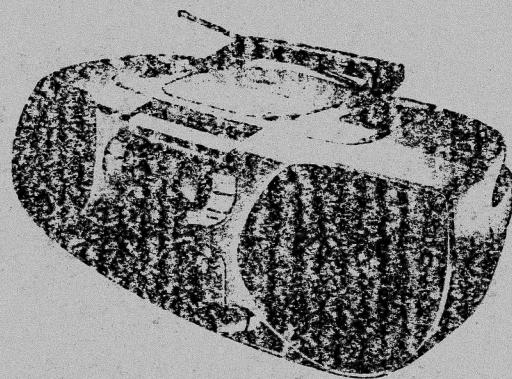


# Service

# Service

# Service



# Service Manual

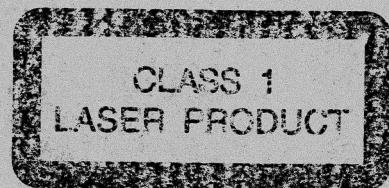


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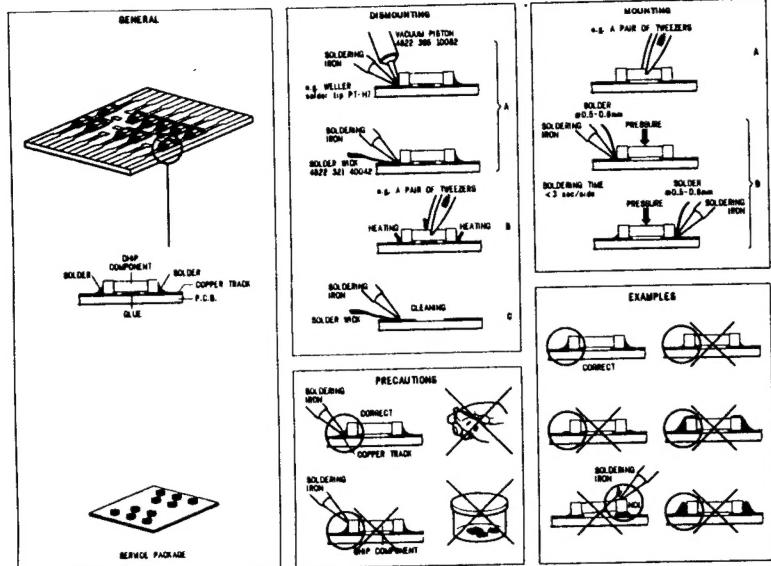
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Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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## HANDLING CHIP COMPONENTS



**GB** **WARNING**  
All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.  
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools at this potential.

**F** **ATTENTION**  
Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement réduite par le fait qu'aucun précaution n'est prise à leur manipulation.  
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enlever le bracelet servi d'une résistance de sécurité.  
Veuillez à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

Anti-static table mat size 1200x650x1.25mm  
small 600x650x1.25mm  
4822 466 10953  
4822 466 10958  
Anti-static wrist band  
4822 395 10223  
Connection box (1MΩm)  
4822 320 11307  
Extendible cable (to connect wrist band to conn. box)  
4822 320 11305  
Connecting cable (to connect table mat to conn. box)  
4822 320 11306  
Earth cable (to connect any product to mat or box)  
4822 320 11308  
Complete kit ESD3 (combining all above products)  
4822 310 10671  
Wristband tester  
4822 344 13999



**D** **WARNUNG**  
Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).  
Umsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.  
Sorgen Sie dafür, dass sie im Reparaturfall über ein Pulseband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.  
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

Anti-static table mat size 1200x650x1.25mm  
small 600x650x1.25mm  
4822 466 10953  
4822 466 10958  
Anti-static wrist band  
4822 395 10223  
Connection box (1MΩm)  
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4822 320 11308  
Complete kit ESD3 (combining all above products)  
4822 310 10671  
Wristband tester  
4822 344 13999

**GB**  
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.  
Safety components are marked by those symbol: ▲

**S** **Warning !**  
Osvyig lasertstrålning när apparaten är oppnåd och spärren är urkopplad. Beträkta ej strålen.

**DK** **Advarsel !**  
Usynlig lasertstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for strålen.

**SF** **Varoitus !**  
Avauttaa laitteessa ja suojailetuksen ohittettaessa olet aittina näkymättömiin laserstraleihin. Älä katso näkseen!

**GB**  
After servicing and before returning the set to customer perform a leakage current measurement test from all exposed metal parts to earth ground. To assure no shock hazard exists.  
The leakage current must not exceed 0.5mA.

**F**  
Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne.

## SPECIFICATIONS

## GENERAL

Mains voltage	-/00/14 : 230 V -/01 : 120 / 230 V -/17 : 120 V
Mains frequency	-/00/14 : 50 Hz -/01 : 50 / 60 Hz -/17 : 60 Hz
Battery	mains : 9 V (R20 x 6) Remote : 3 V (R6 x 2)
Power consumption	: 11 W
Dimension (W x H x D)	: 435 x 270 x 170 mm
Weight	: 3.4 Kg

## AMPLIFIER

Output power	mains : 2 x 1.6 W battery : 2 x 2 W
Speaker impedance	: 2 x 4 ohm
Frequency response	: 100 Hz - 10 kHz (±3dB)

## TUNER - FM SECTION

Tuning range	: 87.5 - 108 MHz
IF frequency	: 10.7 MHz ± 0.03 MHz
Sensitivity	: 22 dBf at 26dB S/N
Selectivity	: 20 dB at 300kHz
IF rejection	: 50 dB
Image rejection	: 20 dB

## SERVICE TOOLS

TORX T10 screwdriver with shaftlength 150mm.....	4822 395 50423
TORX screwdriver set SBC 163.....	4822 295 50145
Audio signal disc SBC 429.....	4822 397 30184
Playability test disc SBC 444.....	4822 397 30245
Test disc 5 (disc without errors) +	
Test disc 5A (disc with dropout errors, black spots and fingerprints)	4822 397 30096
SBC 426/426A.....	
Burn in test disc (65 min. 1kHz signal at -30 dB level without "pause")	4822 397 30155
Universal test cassette Fe SBC 420.....	4822 397 30071

## TUNER - AM SECTION

Tuning range	MW : 522 - 1607 kHz -/17 : 520 - 1730 kHz
Sensitivity	MW : 4000 $\mu$ V/m at 26dB S/N
Selectivity	MW : 16 dB
IF rejection	MW : 24 dB
Image rejection	MW : 28 dB

## AUDIO CASSETTE RECORDER

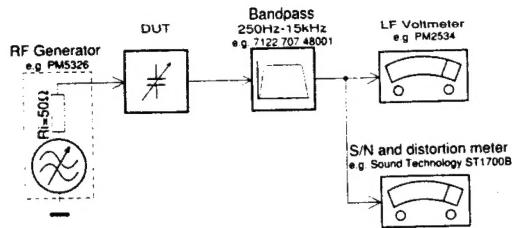
Number of tracks	: 1 stereo
Tape speed	: 4.76 cm/sec ± 3%
Wow & flutter	: < 0.48 JIS UWTD
Fast wind/rewind C60	: < 120 sec.
Frequency response	P/B : 125 - 8000 Hz
S/N ratio	: ≥ 40 dB

## COMPACT DISC

Frequency response	: 100 Hz - 10 kHz
S/N ratio	: > 50 dB
Channel difference	1 kHz : < 3 dB
Channel crosstalk	1 kHz : 26 dB
Laser wavelength	: 780 ± 20 nm
Laser light power	: < 0.5 mW

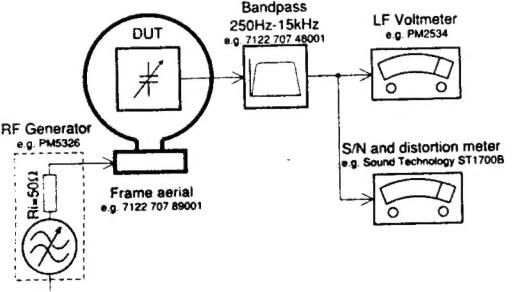
## SERVICE MEASUREMENTS

## Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilot tone (19kHz, 38kHz).

## Tuner AM (MW,LW)



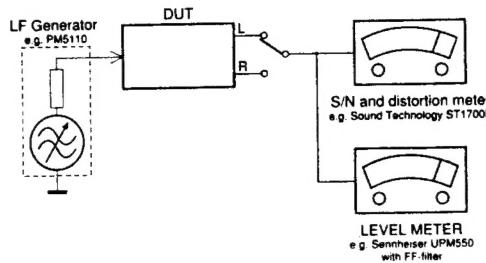
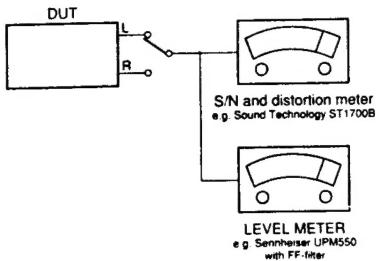
To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.  
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

## CD

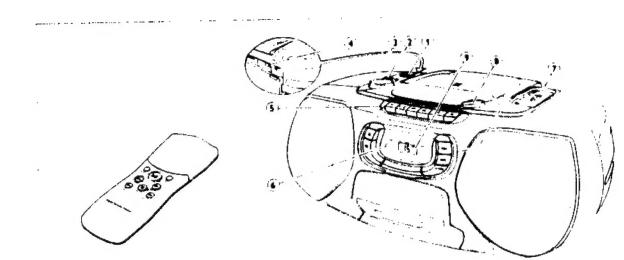
Use Audio Signal Disc SBC429 4822 397 30184  
(replaces test disc 3)

## RECORDER

Use Universal Test Cassette Fe SBC420 4822 397 30071



## CONNECTIONS AND CONTROLS



## BASIC FUNCTIONS

- ① POWER: CD, TAPE, BAND ... selects the sound source
- ② DBB ..... enhances the bass
- ③ VOLUME ..... adjusts the volume level
- ④ 3.5mm headphone socket (back of the set)

Note: Connecting the headphones will switch off the speakers.

## ⑤ CASSETTE RECORDER

- PAUSE ■ ..... interrupts recording or playback
- STOP-OPEN □ △ ..... stops the tape and opens the cassette compartment
- SEARCH ▷ ..... rewinds the tape
- SEARCH ▷▷ ..... fast forwards the tape
- PLAY ▷ ..... starts playback
- RECORD ○ ..... starts recording

- ⑥ ..... Sensor for the infrared remote control

## RADIO

- ⑦ TUNING ..... tunes to radio stations
- ① BAND: FM, MW ..... selects the wave band

## ⑧ CD PLAYER

- △ OPEN ..... opens the CD compartment
- ..... stops CD play and erases the program
- ▷■ ..... starts and interrupts CD play
- ▷▷ ..... skips and searches forward
- ◁◁ ..... skips and searches backward
- CD MODE ..... selects the different CD playing modes and programs tracks

- ⑨ ..... Display

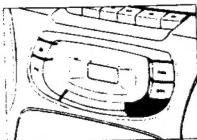
## REMOTE CONTROL

- SHUFFLE ..... plays CD tracks in random order
- REPEAT ..... repeats a track, the entire CD or the program
- ▷■ ..... starts and interrupts CD play
- ▷▷ ..... selects the beginning of the current, a previous or a subsequent track of a CD
- STOP ..... stops CD play and erases the program
- ◁▷ SEARCH ..... searches backward/forward in a CD track

**CD MODE: Programming track numbers**

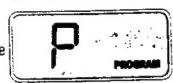
You can select a number of tracks and store these in the memory in the desired sequence. You can store any track more than once. A maximum of 20 tracks can be stored in the memory.

1 When CD play is stopped, select the desired track with  $\leftarrow$  or  $\rightarrow$ .



2 As soon as the number of the desired track is displayed, press CD MODE to store the track in the memory.

→ PROGRAM appears on the display. P lights up briefly, then the number of the stored track is shown.

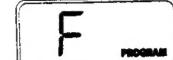


3 Select and store all desired tracks in this way.

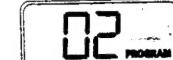
4 You can review your settings by pressing and holding CD MODE for more than 1 second.

→ The display shows all stored track numbers in sequence.

If you try to store more than 20 tracks, the display shows F.

**Playing the program**

Press  $\blacktriangleright$  to play the program.

**Erasing the program**

From the stop position, press  $\square$ .

→ P lights up briefly, PROGRAM disappears and your program is erased.

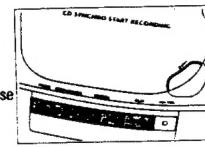


*Note: The program will also be erased if you:*

- interrupt the power supply,
- open the CD compartment, or
- move the POWER slider.

**Playing a cassette**

1 Set the POWER slider to TAPE.



2 Press STOP-OPEN  $\square$   $\Delta$  to open the cassette compartment.

3 Insert a recorded cassette with the open side upwards and close the cassette compartment.

4 Press PLAY  $\blacktriangleleft$  to start playback.

5 Press  $\blacktriangleright$  or  $\leftarrow$  to rewind or fast forward the tape.

6 To stop the tape press STOP-OPEN  $\square$   $\Delta$ .

*Note: The keys are released at the end of the tape.*

**General information on recording**

Recording is permissible insofar as copyright or other rights of third parties are not infringed upon.

For recording on this set you should use a cassette of the type NORMAL (IEC type I). This deck is not suitable for recording on cassettes of the type CHROME (IEC type II) or METAL (IEC type IV).

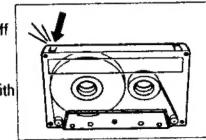
The recording level is set automatically. The controls VOLUME and DBB do not affect the recording.

At the very beginning and end of the tape, no recording will take place in the 7 seconds during which the leader tape passes the recorder heads.

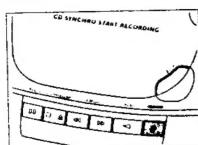
**Protecting tapes from accidental erasure**

Keep the cassette side to be protected in front of you and snap off the left tab. Now, recording on this side is no longer possible.

To record again on this side of the cassette, cover the opening with a piece of adhesive tape.

**Recording from the CD player – CD synchro start**

1 Set the POWER slider to CD.



2 Insert a CD and, if desired, program the track numbers.

3 Press STOP-OPEN  $\square$   $\Delta$  to open the cassette compartment.

4 Insert a blank, unprotected, cassette and close the cassette compartment.

5 Press RECORD  $\odot$  to start recording.  
→ Playing of the CD or program starts automatically.

6 For brief interruptions press PAUSE  $\blacksquare$ . Press the PAUSE  $\blacksquare$  key again to resume recording.

7 To stop recording, press STOP-OPEN  $\square$   $\Delta$ .

*Note: the recording can be started from different positions:*

- if the CD player is in pause mode, recording will start from this very position (use  $\leftarrow$  or  $\rightarrow$ ).
- if the CD player is in stop mode, recording will start from the beginning of the CD or program.

**Recording from the radio**

1 Tune to the desired radio station (see "RADIO").

2 Press STOP-OPEN  $\square$   $\Delta$  to open the cassette compartment.

3 Insert a blank, unprotected, cassette and close the cassette compartment.

4 Press RECORD  $\odot$  to start recording.

5 For brief interruptions press PAUSE  $\blacksquare$ . To resume recording press the PAUSE  $\blacksquare$  key again.

6 To stop recording, press STOP-OPEN  $\square$   $\Delta$ .

**General maintenance**

Do not expose the set, batteries, CDs, or tapes to humidity, rain, sand, or excessive heat (caused by heating equipment or direct sunlight).

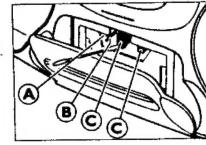


The mechanical parts of the set contain self-lubricating bearings and must not be oiled or lubricated!

You can clean the set with a soft, slightly dampened, lint-free cloth. Do not use any cleaning agents as they may have a corrosive effect.

**Tape deck maintenance**

To ensure proper recording and playback quality, clean parts A, B and C after approximately 50 hours of operation. Use a cotton swab slightly moistened with alcohol or head-cleaner fluid.



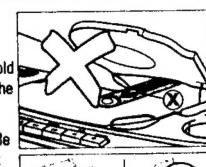
Press PLAY  $\blacktriangleleft$  and clean the rubber pressure roller A.

Press PAUSE  $\blacksquare$  and clean the capstan B and the heads C.

*Note: Cleaning of the heads C can also be done by playing a cleaning tape once.*

**CD player and CD handling**

The lens X of the CD player should never be touched. Always keep the CD compartment closed to avoid dust on the lens.



The lens may cloud over when the set is suddenly moved from cold to warm surroundings. Playing a CD is not possible then. Leave the CD player in a warm environment until the moisture evaporates.

To take the CD out of its box easily, press the centre spindle while lifting the CD. Always pick up the CD by the edge and put it back in its box after use.

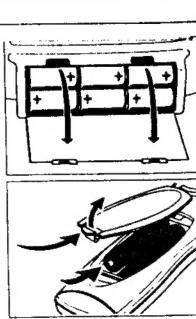


To clean the CD, wipe it in a straight line from the center toward the edge using a soft, lint-free cloth. A cleaning agent may damage the disc!

Never write on a CD or attach a sticker to it.

**Batteries****For the set (optional)**

Open the battery compartment of the set and insert 6 batteries, type R20, UM-1 or D-cells (preferably alkaline).

**For the remote control (supplied)**

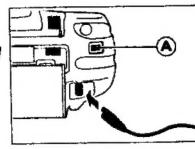
Open the battery compartment of the remote control and insert 2 batteries, type R03, UM-4 or AAA-cells (preferably alkaline).

Remove batteries if they are flat or if the set is not going to be used for a long time.

**Batteries contain chemical substances, so they should be disposed of properly.**

**Mains**

1 Check whether the mains voltage as shown on the type plate corresponds to your local mains voltage. If it does not, consult your dealer or service organisation. **The type plate is located on the bottom of the set.**



2 If the set is equipped with a VOLTAGE selector (Ⓐ), set this selector to the local mains voltage.

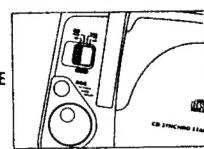
3 Connect the mains cable to the AC MAINS socket and the wall socket. This switches on the mains supply. **The mains cable is inside the battery compartment.**

The battery supply will be switched off when the set is connected to the mains. To change over to battery supply, pull out the plug from the unit's AC MAINS socket.

To disconnect the set from the mains completely, remove the mains plug from the wall socket.

**Switching the set on and off**

Set the POWER slider to the desired sound source: CD, TAPE, or BAND (for radio).

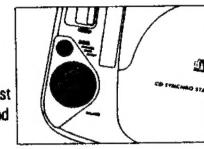


The set is switched off when the POWER slider is set to OFF/TAPE and the keys of the tape deck are released.

*Note: If you use batteries, switch the set off after use. This will avoid unnecessary power consumption.*

**Adjusting volume and sound**

Adjust the volume using the VOLUME control.

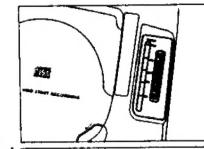


Increase and decrease the bass level by pressing DBB. The bass level can also be emphasised if you place the set against wall or shelf. Do not cover any vents; leave sufficient room around the unit for ventilation.

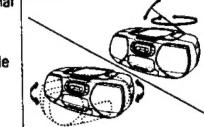
**Radio – tuning to radio stations**

1 Set the POWER slider to FM or MW to select the desired wave band.

2 Tune to the desired radio station by using the TUNING wheel.

**Improving RADIO reception**

For FM stations, pull out the telescopic antenna. To improve the signal, incline and turn the antenna. Reduce its length if the signal is too strong (very close to a transmitter).



For MW stations, direct the built-in antenna by turning the whole set. The telescopic antenna is not needed.

**Playing a CD**

1 Set the POWER slider to CD.

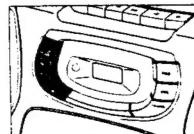


2 Press △ OPEN to open the CD compartment.



3 Insert an audio CD (printed side up) and close the CD compartment.

→ The CD player starts and scans the contents list of the CD. Then, the CD player stops. Display indication: the total number of tracks.



4 Press the ▶ button to start CD play.

→ Display indication: the current track number.



5 Press the □ button to stop CD play.

→ Display indication: the total number of tracks.

You can interrupt CD play by pressing ▶. Continue CD play by pressing the button again.

→ Display indication: the current track number (flashing).



**Note: CD play will also stop if:**

- you open the CD compartment,
- the end of the CD is reached, or
- you move the POWER slider.

If you make a mistake when operating the CD player, or if the CD player cannot read the CD, the display shows E or NO. (See "TROUBLESHOOTING".)



If you press ▶ and there is no CD inserted, the display shows NO.

**Search backward ↔ and forward ↔****Selecting another track**

Briefly press the ↔ or ↔ button once/several times to skip to the beginning of the current, previous or subsequent track(s).

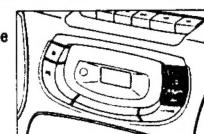
**During CD play:**

CD play continues automatically with the selected track.

**When CD play is stopped:**

Press ▶ to start CD play.

→ Display indication: the selected track number.

**Searching for a passage during CD play**

1 Hold down the ↔ or ↔ button to find a particular passage in a forward or backward direction.

→ CD play continues at a low volume.

2 Release the button when you have reached the desired passage.

*Note: In the different CD modes or when playing a program, searching is only possible within the particular track.*

**CD MODE: Shuffle and Repeat**

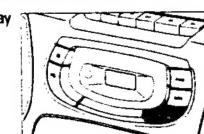
1 During CD play press CD MODE repeatedly to cause the display to show the different playing modes.

→ **SHUFFLE:** All tracks of the CD (or program) are played in random order.

→ **SHUFFLE REPEAT ALL:** All tracks of the CD (or program) are played repeatedly in random order.

→ **REPEAT:** The current track is played repeatedly.

→ **REPEAT ALL:** The entire CD (or program) is played repeatedly.



2 After 2 seconds of flashing display indication, CD play starts in the chosen mode.

3 To return to normal CD play, press CD MODE until the display indication disappears.



**WARNING**

*Under no circumstance should you try to repair the set yourself as this will invalidate the guarantee.*

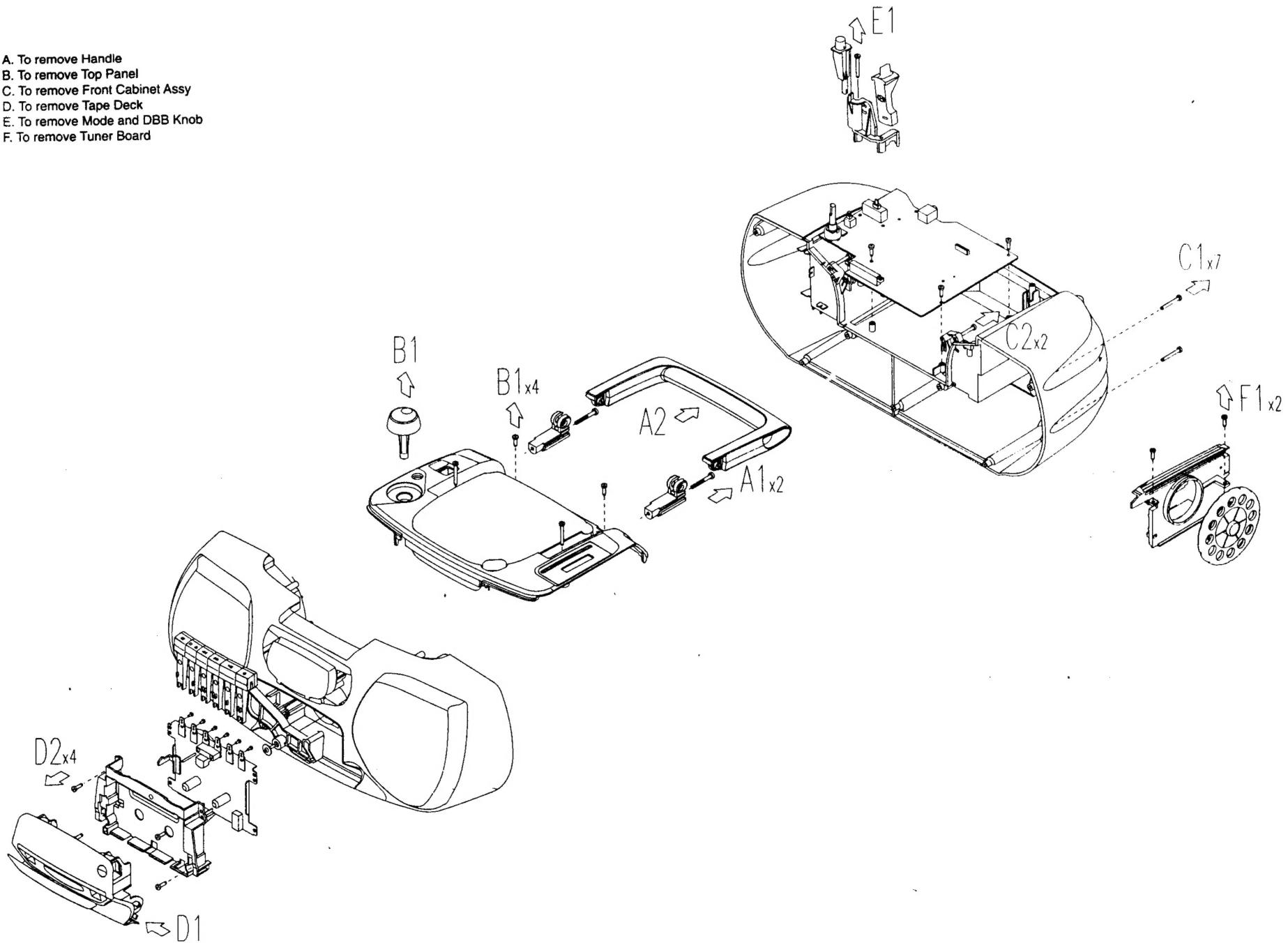
If a fault occurs, first check the points listed below before taking the set for repair.

If you are unable to solve a problem by following these hints, consult your dealer or service center.

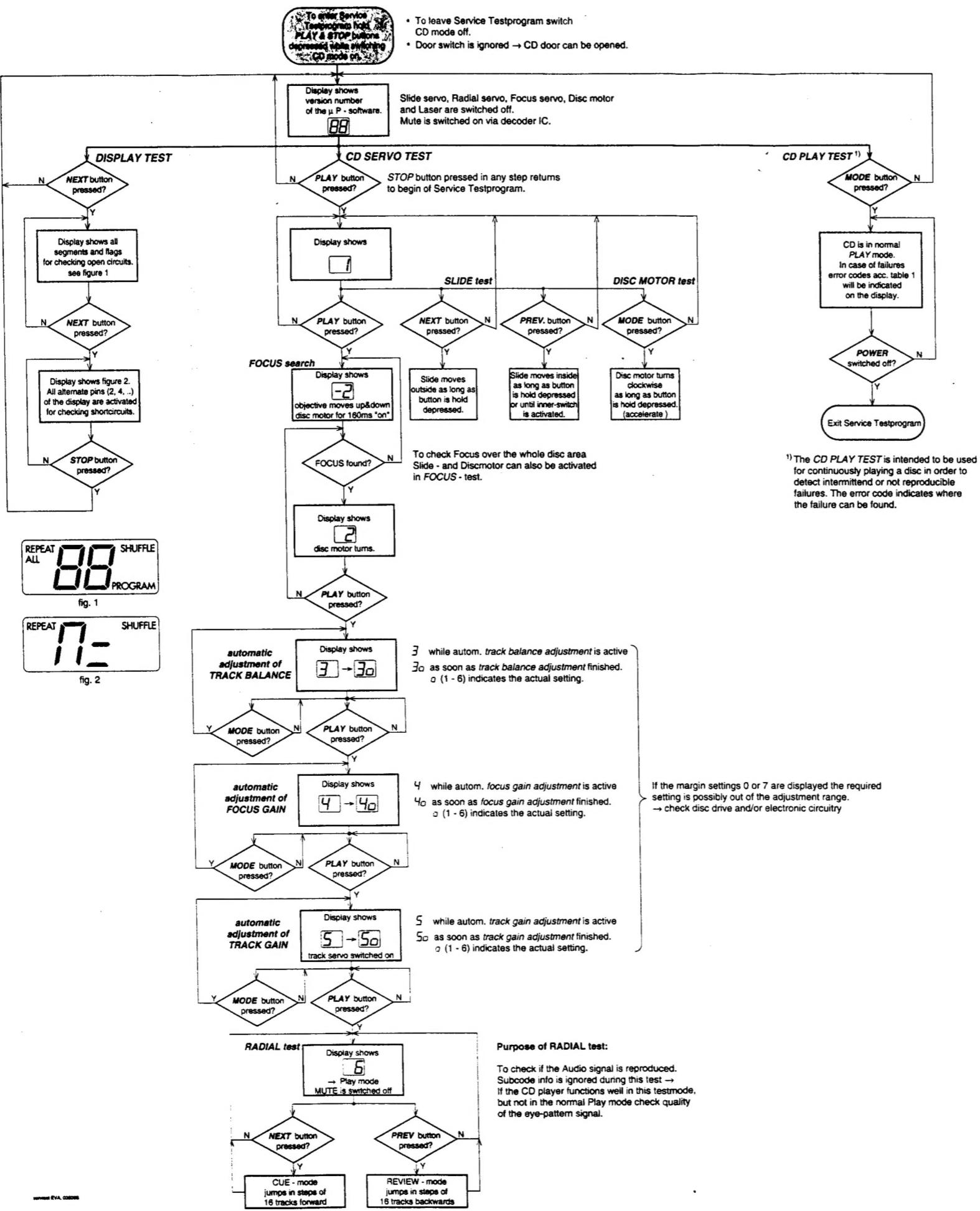
Problem	Possible cause	Solution
No sound, no power	VOLUME is not adjusted. Headphones are connected. Mains cable is not securely connected. Batteries are flat. Batteries are inserted incorrectly. Trying to change over from mains to battery supply without removing the plug.	Adjust volume. Disconnect headphones. Connect mains cable properly. Insert fresh batteries. Insert batteries correctly. Remove the mains plug from the unit's AC MAINS socket.
No reaction to operation of any keys	Electrostatic discharge.	Disconnect the set from power supply, reconnect after a few seconds.
Poor radio reception	Weak radio signal.	Direct the antenna for optimum reception.
no or E indication	Interference caused by electrical equipment like TVs, computers, engines, etc.	Keep the radio away from electrical equipment.
The CD skips tracks	The CD is badly scratched or dirty. No CD is inserted. The CD is inserted upside down. The laser lens is steamed up.	Replace or clean the CD. Insert a CD. Insert CD with label facing up. Wait until the lens has cleared.
Poor cassette sound quality	The CD is damaged or dirty. SHUFFLE or PROGRAM is active. Dust and dirt on the heads, capstans or pressure rollers. Use of unsuitable cassette types (METAL or CHROME) for recording.	Replace or clean the CD. Switch off SHUFFLE or PROGRAM. Clean heads, capstans, and pressure rollers. Only use NORMAL type cassettes for recording.
Recording does not work	Cassette tab(s) may be snapped off.	Apply a piece of adhesive tape over the opening.
Remote control does not function properly	Batteries are inserted incorrectly. Batteries are flat. Distance to the set is too large.	Insert batteries correctly. Insert fresh batteries. Reduce distance.

## DISASSEMBLY DIAGRAM

- A. To remove Handle
- B. To remove Top Panel
- C. To remove Front Cabinet Assy
- D. To remove Tape Deck
- E. To remove Mode and DBB Knob
- F. To remove Tuner Board



## SERVICE TESTPROGRAM



## CD ERROR codes

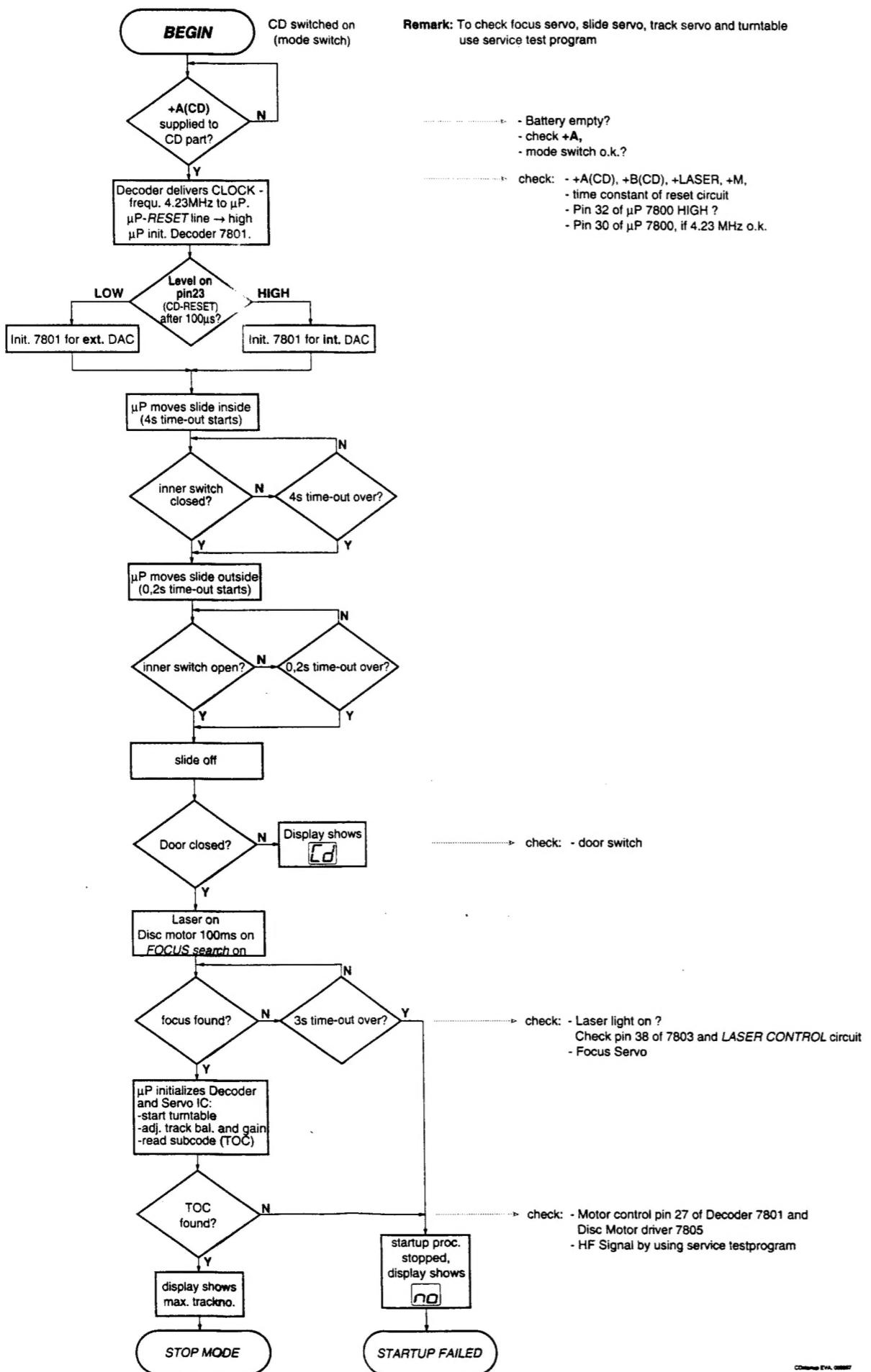
Error number	Error description	Error type
E0	Focus Error Triggered when the focus is lost for more than 250ms during playing the CD.	W
E2	Slide-In error Generated when the inner-switch did not close within approx. 4s when the pick up is moved inside. Inner-switch or slide motor problems.	W
E3	Slide-out error Generated when the inner-switch did not open within approx. 250ms when the pick up is moved from the inner position outside. Inner-switch or slide motor problems.	W
E5	Jump error. Triggered when the servo processor counts too less tracks in a defined time during JUMPS. This can be caused by a disturbed HF-signal (the tracks cannot be recognized exactly), slide motor problems, track servo problems or scratched discs.	W
E6	Subcode Error No valid subcode for 300ms during PLAY.	W
E7	PLL lock error When the PLL did not lock after 10 retries then this warning message is generated and the servo is stopped and restarted (as if the user would have pressed STOP and then PLAY immediately) to recover.	W
F0	Focus Search Error Triggered when the focus could not be found within 3s when starting up the CD.	F
F2	Fatal Subcode Error No valid subcode for more than 4s during PLAY.	F

table 1

Error type: W = Warning → set continues operation, message remains on the display until next error occurs or any key is pressed.

F = Fatal Error → set stops operation, message remains on the display.  
(The set can only be operated again via a reset)

## CD STARTUP PROCEDURE



## Abbreviations and Pin-descriptions of CD ICs

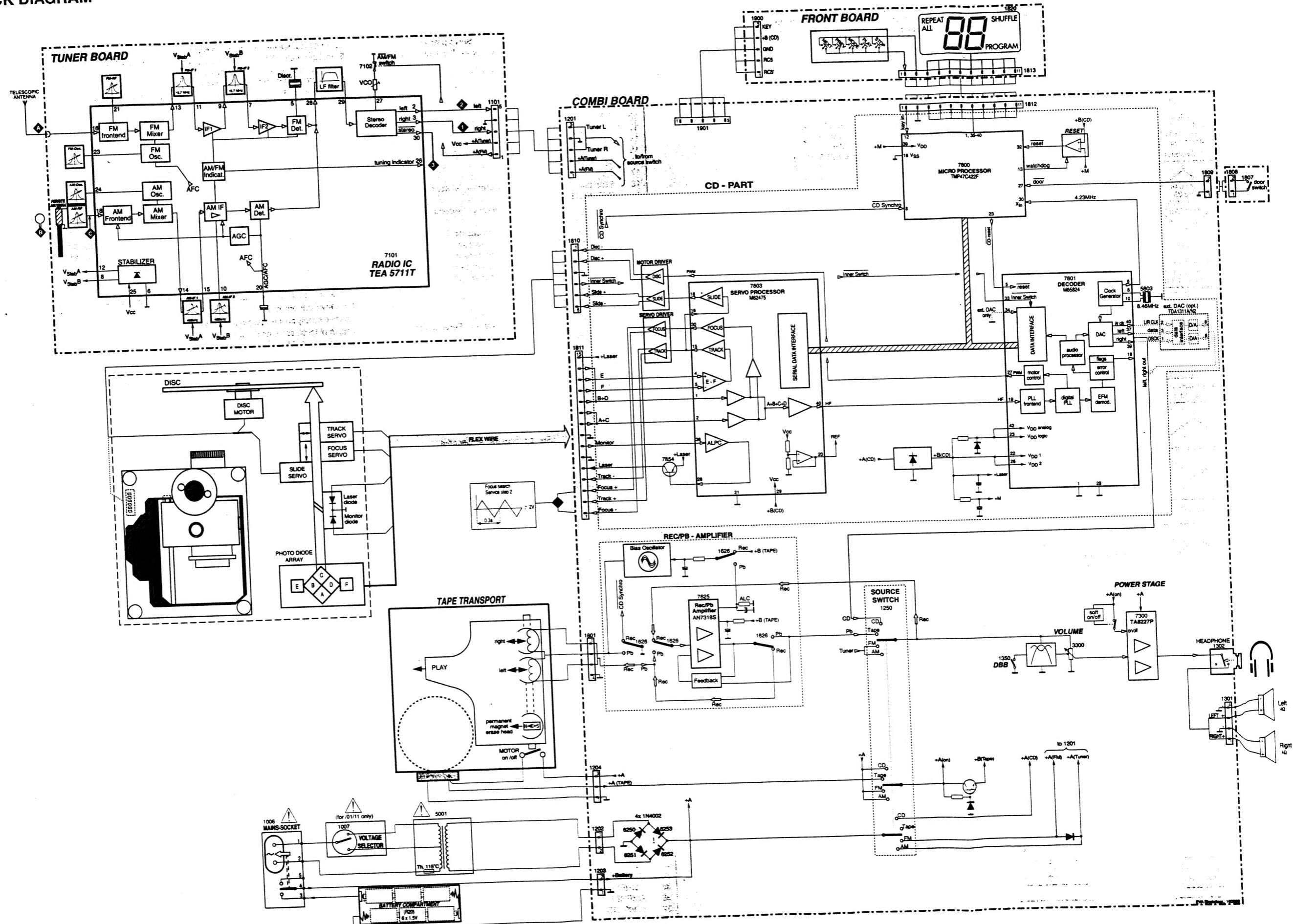
## SERVO PROCESSOR M62475FP

Pin	Name	Direction	Description
1-3	A, B, C	Diode array $\rightarrow$ Servo processor	Current input (central photo diode signal input)
4-5	E, F	Diode array $\rightarrow$ Servo processor	Current input (satellite photo diode signal input)
6	SGT	Servo processor $\rightarrow$ Track error ampl. Input	Signal generator output to track servo, sends 1700Hz for adjustment procedure
7	TE -	-	Inverting input of track error amplifier
8	TEGain	-	Gain control pin of track error amplifier
9	TG1	-	Track Gain 1 - switch: controls the gain of the track servo amplifier
10	TE out	-	Track Error amplifier output
11	TC/Shock	-	Track Cross/Shock detector input
12	TS +	-	Non inverting input of track servo amplifier
13	TG2	not connected	Track Gain 2 - switch: controls the gain of the track servo amplifier
14	TS -	-	Inverting input of side servo amplifier
15	TS out	Servo processor $\rightarrow$ Servo driver	Output of track servo amplifier
16	SS +	-	Non inverting input of slide servo amplifier
17	SS -	-	Inverting input of slide servo amplifier
18	Slide out	Servo processor $\rightarrow$ Motor driver	Output of slide servo amplifier
19	DET. FILTER	-	Pin for connection of DETection FILter capacitor of ADJUST LOGIC
20	BIAS	Servo processor $\rightarrow$ external electronic	Reference Voltage output Vcc/2 of internal BIAS-generator
21	GND	-	Ground connection pin (negative supply)
22	MLA/DIS	$\mu$ P $\rightarrow$ Servo processor	Serial interface Microprocessor Latch control/DIScharge control for adjustment
23	JP1/SG	$\mu$ P $\rightarrow$ Servo processor	Serial interface Jump control line/Signal Generator input line for adjustment
24	MCK	$\mu$ P $\rightarrow$ Servo processor	Serial interface Clock input line
25	MSD	$\mu$ P $\rightarrow$ Servo processor	Serial interface Data input line
26	D <sub>out</sub>	Servo processor $\rightarrow$ $\mu$ P	Serial interface Data output line
27	C <sub>LPF</sub>	-	Pin for connection of Low Pass Filter capacitor of ADJUST LOGIC
28	I <sub>REF</sub>	-	Reference current input
29	V <sub>cc</sub>	-	Positive supply connection pin (4V - 5.5V)
30	FS <sub>OUT</sub>	Servo processor $\rightarrow$ Servo driver	Output of focus servo amplifier
31	FS -	-	Inverting input of focus servo amplifier
32	FEGain	-	Gain control pin of focus error amplifier
33	FE -	-	Inverting input of focus error amplifier
34	SGF	Servo processor $\rightarrow$ Focus error ampl. Input	Signal generator output to focus servo, sends 1300Hz for adjustment procedure
35	C <sub>FSR</sub>	-	Charge capacitor for Focus Search triangle-generator
36	ALPC +	-	Non inverting input of Automatic Laser Power amplifier
37	ALPC -	-	Inverting input of Automatic Laser Power Control amplifier
38	ALPC <sub>out</sub>	Servo processor $\rightarrow$ Laser driver	Output of Automatic Laser Power Control amplifier
39	MRC	-	Connection pin for capacitor of Mirror detector
40	HF	Servo processor $\rightarrow$ Decoder	Output of HF amplifier
41	HFI	-	Inverting input of HF amplifier
42	ABC	-	Sum output of amplified A, B and C input (central photo diode signal input) to external ac-coupling capacitor

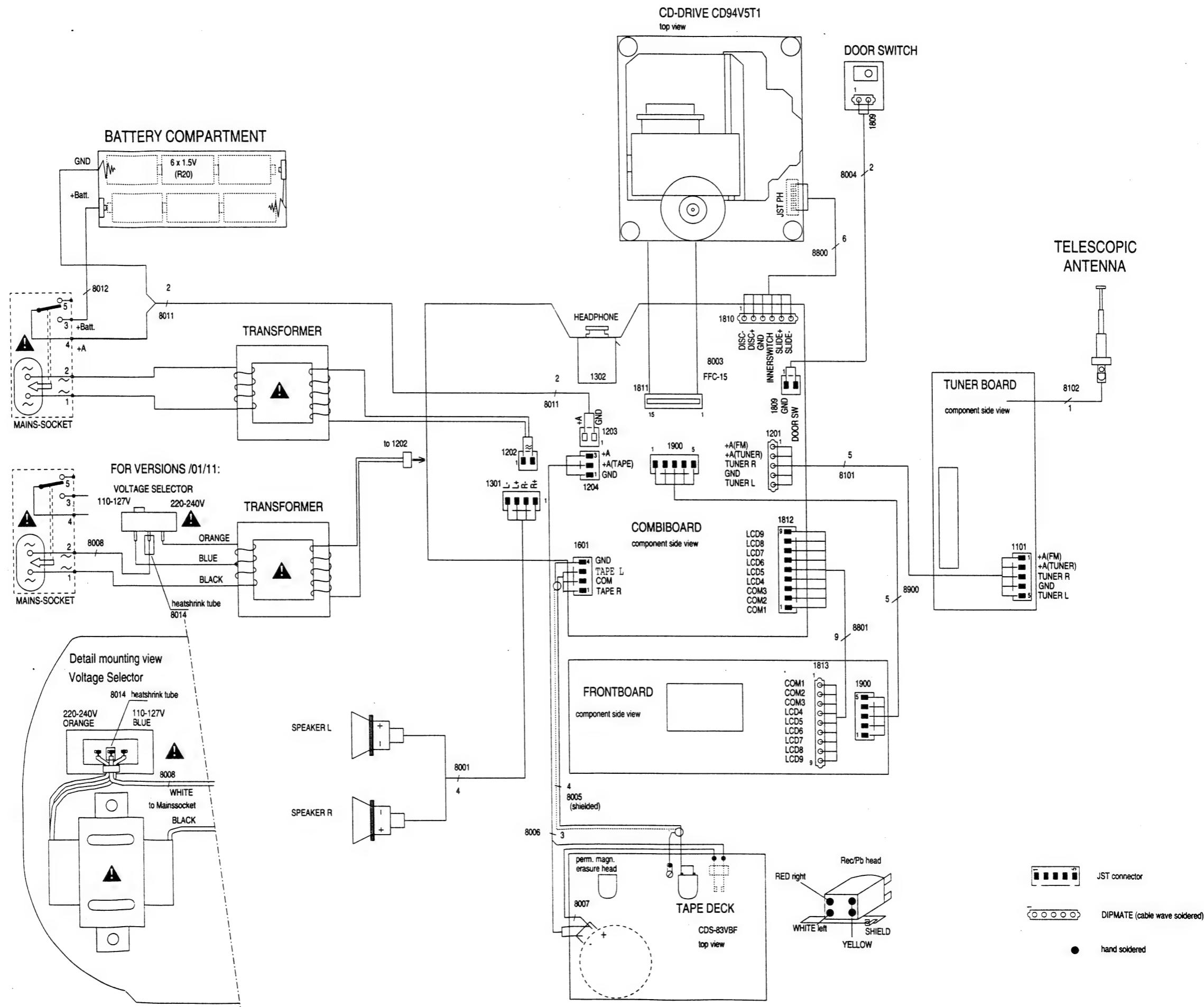
## SERVO PROCESSOR M65824FP

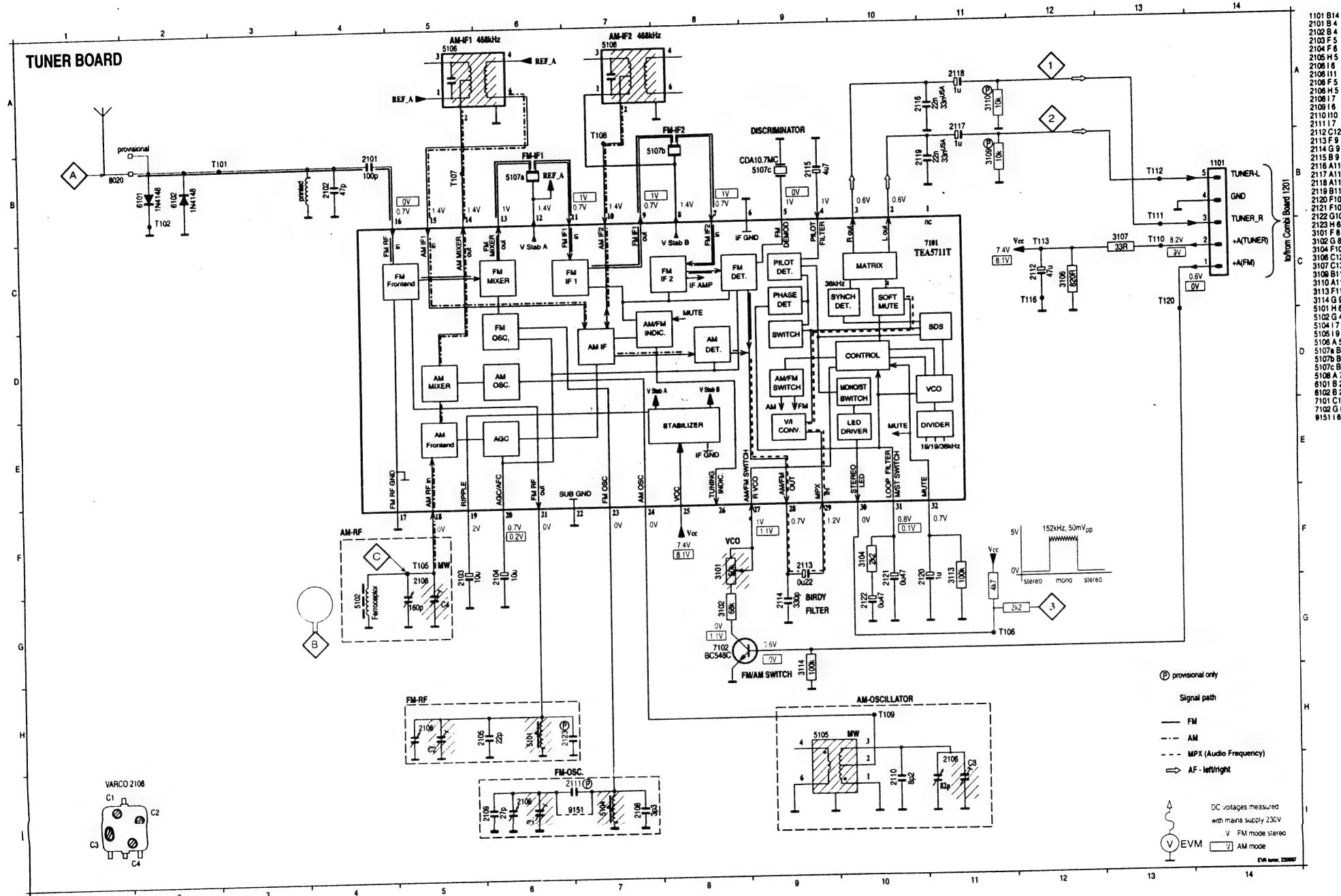
Pin	Name	Direction	Description
1	Anal. V <sub>ss</sub>	-	Analog system ground
2	ADJCLK	not connected	Clock output for servo adjustment; f=88.2kHz
3	LOCK	not connected	Lock monitor / low disc rotation output
4	CKSEL	-	System clock selection. Low=8.4672MHz, high=16.9344MHz
5	RESET	$\mu$ P $\rightarrow$ Signal processor	System reset (low level = active)
6	C423	Signal processor $\rightarrow$ $\mu$ P	4.2336MHz clock output
7	C846	not connected	8.4672MHz clock output
8	XI	X-Tal $\rightarrow$ Signal processor	Crystal oscillator input
9	DVSS	-	Digital system ground
10	XO	Signal processor $\rightarrow$ X-Tal	Crystal oscillator output
11	TEST	-	Normal / Test selection input. Testmode = high
12	SBCO	not connected	Subcode serial output
13	SCCK	-	Shift clock input for subcode data read
14	SYCLK	not connected	Frame lock status output. Lock = high
15	EFFK	not connected	EFM frame clock output. Duty = 50%
16	KILLB	not connected	Digital silence mute output. Digital zero = low
17	EST1	not connected	Error monitor output 1
18	EST2	not connected	Error monitor output 2
19	HF	Servo processor $\rightarrow$ Signal processor	HF signal input
20	TLC	-	Slice level control signal output
21	LPF	-	PLL loop filter
22	Dig. V <sub>dd</sub>	-	Digital interface power supply
23	DSPS	-	Digital system power supply
24	SBQS	not connected	Interrupt signal to read out subcode Q data. Read = low
25	CRCF	not connected	Subcode Q-channel Cyclic Redundance Check Flag output. CRC o.k. = high level
26	SCAND	not connected	Subcode sync signal detection. Sync = high
27	PWM	Signal processor $\rightarrow$ Motor driver	Disc motor driving (Pulse Width Modulation) output
28	DVDD2	-	Digital interface power supply 2
29	DVSS2	-	Digital system ground 2
30	MCK	$\mu$ P $\rightarrow$ Signal processor	$\mu$ P interface shift Clock input
31	MSD	$\mu$ P $\leftrightarrow$ Signal processor	$\mu$ P interface Serial Data I/O line
32	MLAB	$\mu$ P $\rightarrow$ Signal processor	$\mu$ P interface Latch clock input (internal 22k pull up resistor)
33	EXP1	$\rightarrow$ Signal processor	Versatile input pin (internal 4.7k pull up resistor)
34	EXP2	$\rightarrow$ Signal processor	Versatile input pin (internal 4.7k pull up resistor)
35	CGREF	$\rightarrow$ Signal processor	Charge-pump for LPF reference current input
36	AMPREF	not connected	Op-amp for LPF reference voltage setting
37	LOUT/DO	Signal processor $\rightarrow$	Audio signal output (left channel) / Ext. DAC mode: Audio serial data output
38	LNEG	not connected	Charge pump output (left channel) / Ext. DAC mode: Wordclock output
39	ROUT/DSCK	Signal processor $\rightarrow$	Audio signal output (right channel) / Ext. DAC mode: Data shift clock output
40	RNEG/LRCK	Signal processor $\rightarrow$	Charge pump output (right channel) / Ext. DAC mode: L/R clock output
41	IREF	-	Current reference
42	Anal. V <sub>dd</sub>	-	Analog system power supply

## BLOCK DIAGRAM



## WIRING DIAGRAM

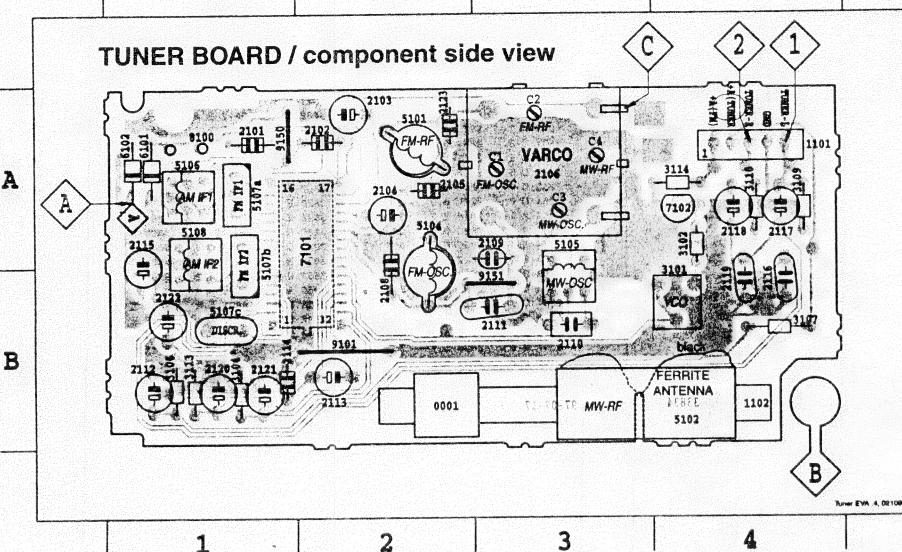




0001 B 2	2104 A 2	2111 B 3	2117 A 4	2123 A 2	3109 A 4	5104 B 2	5108 A 1	9101 B 2
1101 A 4	2105 A 2	2112 B 1	2118 A 4	3102 B 4	3110 A 4	5105 B 3	6101 A 1	9150 A 1
1102 B 4	2106 A 3	2113 B 2	2119 B 4	3102 A 4	3113 B 1	5106 A 1	6102 A 1	9151 B 3
2101 A 1	2108 A 2	2114 B 1	2120 B 1	3104 B 1	3114 A 4	5107a A 1	7101 A 2	
2102 A 2	2109 A 3	2115 A 1	2121 B 1	3106 B 1	5101 A 2	5107b A 1	7102 A 4	
2103 A 2	2110 B 3	2116 B 4	2122 B 1	3107 B 4	5102 B 4	5107c B 1	8100 A 1	

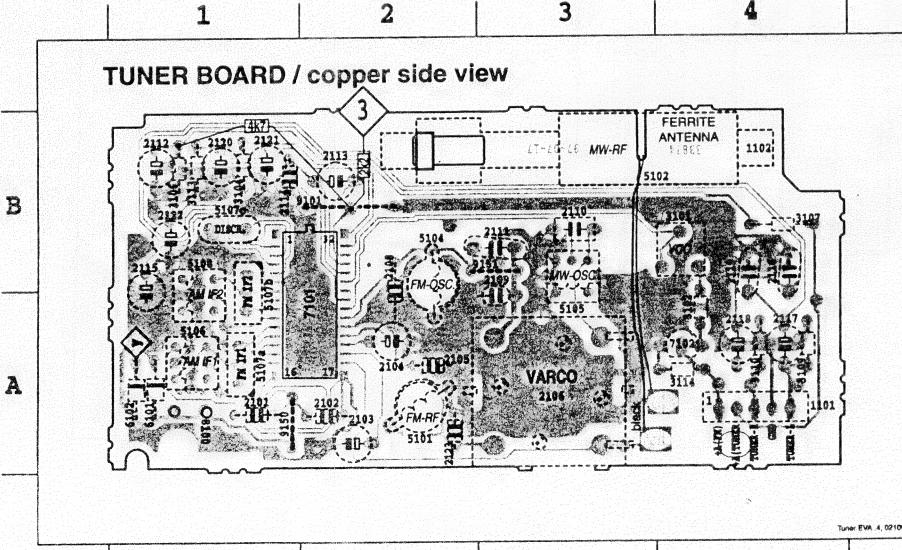
1      2      3      4

TUNER BOARD / component side view



1      2      3      4

TUNER BOARD / copper side view



1      2      3      4

## TUNER ADJUSTMENT TABLE

Waverange	Input Frequency	Input	Set tuned to	Adjust	Measure on	Scope / Counter
<b>OSCILLATOR</b>						
FM <sup>1)</sup> 87.5 - 108 MHz	87.35 MHz	A	lower band end	5104	1 or 2	
	108.25 MHz	$\Delta f = \pm 500\text{kHz}$ $V_{RF} = 100\mu\text{V}$	upper band end	2106 C1		
MW 525 - 1607 kHz (525 kHz) (530 - 1710 kHz) <sup>2)</sup>	512 kHz (525 kHz)	C	lower band end	5105	1 or 2	
	1635 kHz (1720 kHz)	$\Delta f = \pm 30\text{kHz}$ $V_{RF} = 100\mu\text{V}$	upper band end	2106 C3		
<b>FM - RF</b>						
FM 87.5 - 108 MHz	87.5 MHz	A	87.5 MHz	5101	1 or 2	
	108 MHz	$\Delta f = \pm 500\text{kHz}$ $V_{RF} = 100\mu\text{V}$	108 MHz	2106 C2		
<b>VCO</b>						
FM	98 MHz	A	98 MHz	3101	3	
	continuous wave $V_{RF} = 1\text{mV}$				$7101$ pin 30 $2\text{k}\Omega$ $1\text{K}\Omega$ $V_{CC}$	$152 \pm 1\text{ kHz}^3)$
<b>AM - IF</b>						
MW	468 kHz	C	5106	1 or 2		
	connect pin 24 of IC 7101 (AM Osc) with short wire to ground	$\Delta f = \pm 15\text{kHz}$ $V_{RF} = 10\text{mV}$	5108			
<b>AM - RF</b>						
MW	560 kHz	B	560 kHz	5102 (ferroceptor coil)	1 or 2	
	1500 kHz	$\Delta f = \pm 30\text{kHz}$ $V_{RF}$ as low as possible	1500 kHz	2106 C4		

repeat

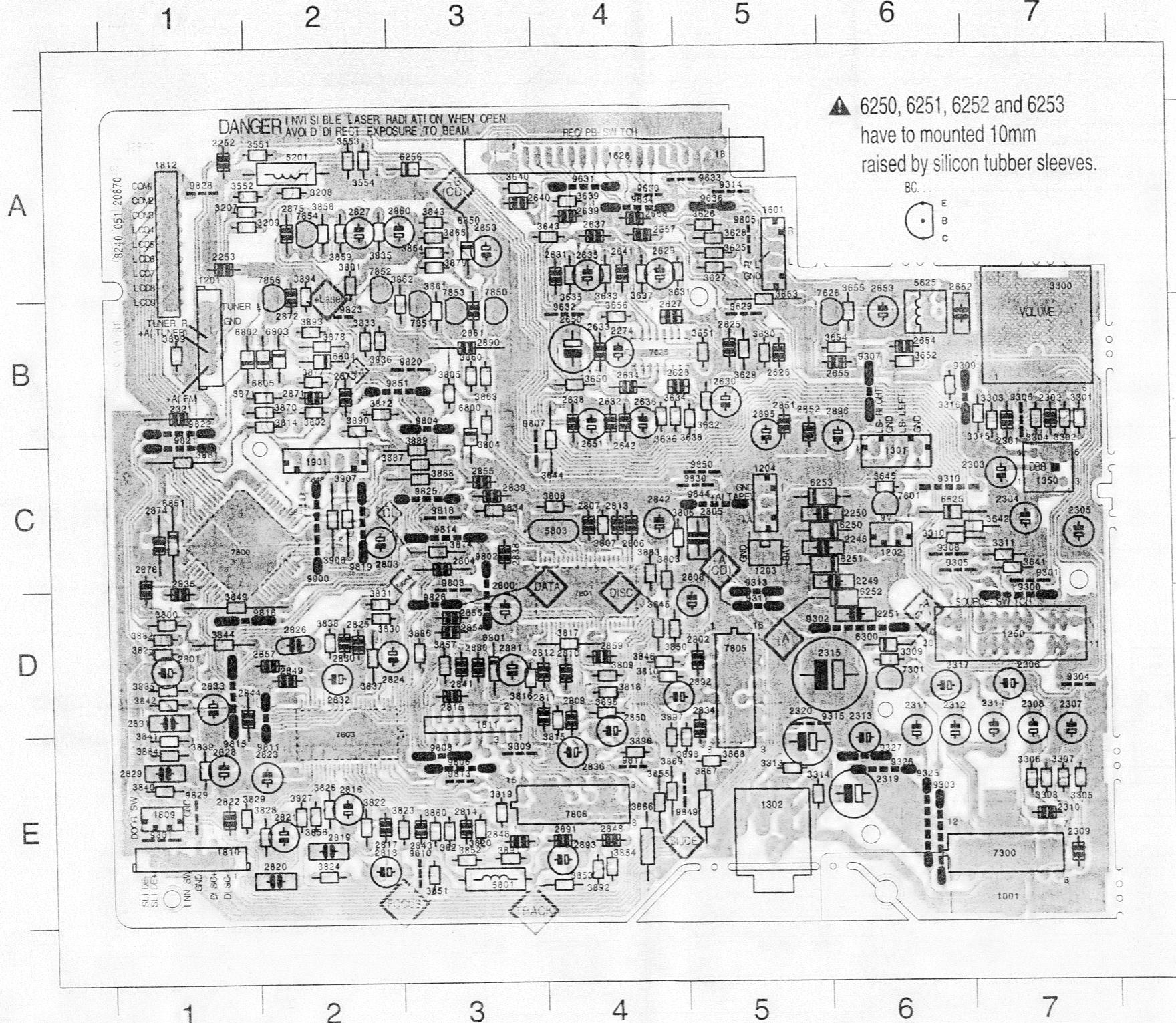
1) Check if capacitor 2109 stands upright before starting adjustments.

2) for USA /17

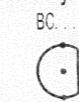
3) If sensitivity of frequency counter is too low adjust to max. channel separation  
(input signal: stereo left 90% + 9%, adjust output on right channel to minimum).

4) RC-network serves for damping the IF-filter while adjusting the other one.

## COMBI BOARD - LAYOUT DIAGRAM

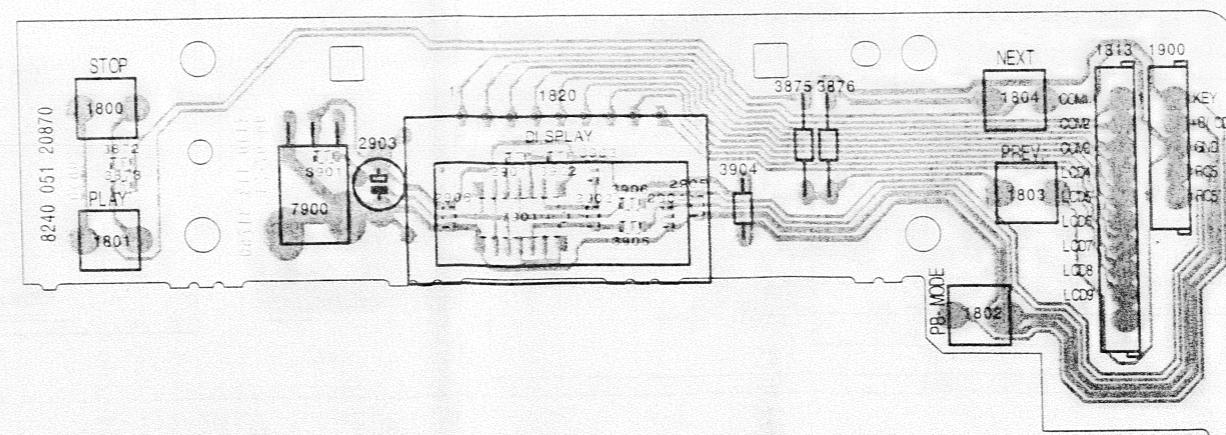


▲ 6250, 6251, 6252 and 6253  
have to be mounted 10mm  
raised by silicon rubber sleeves.

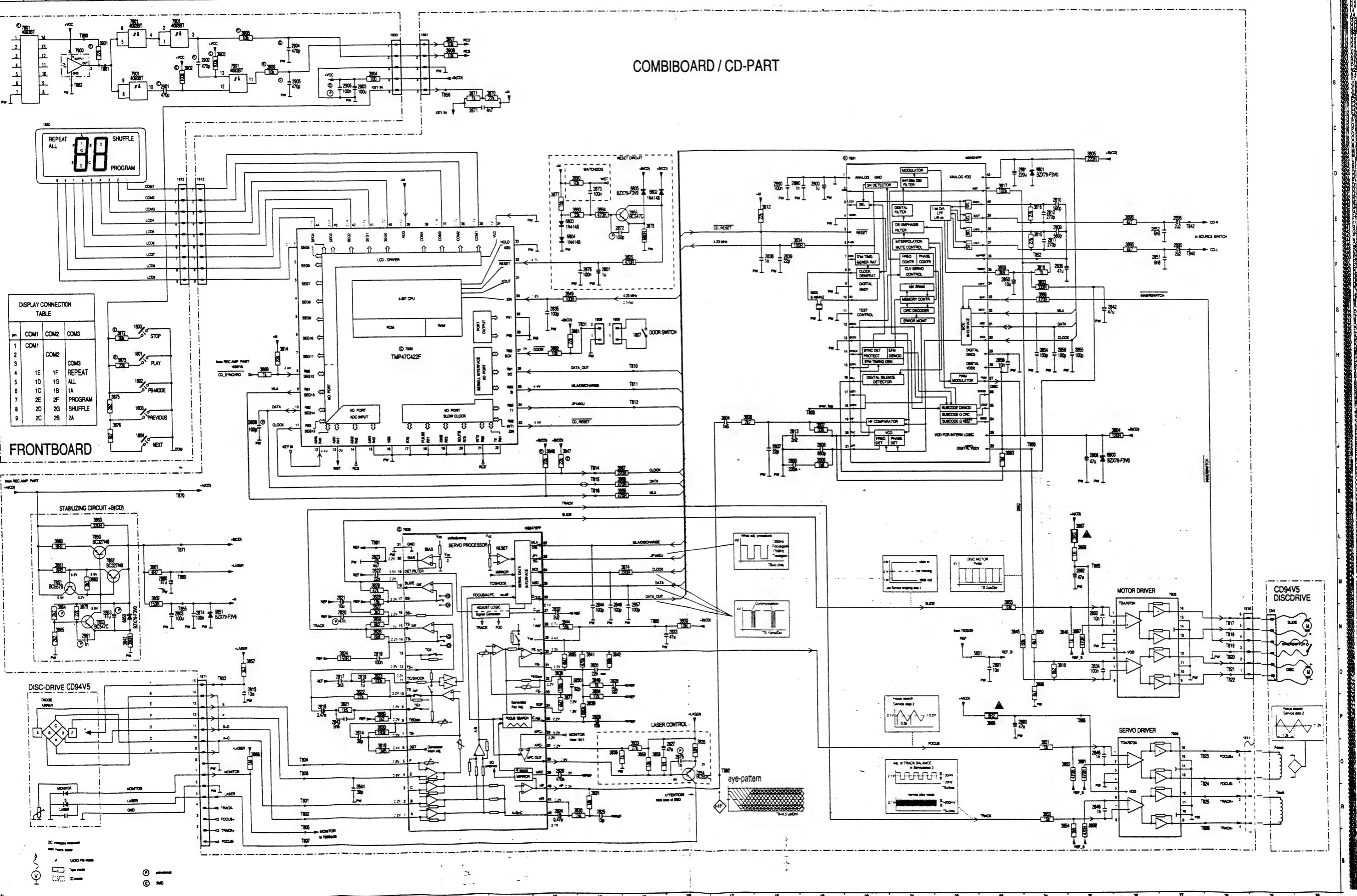


1201 B 1	2657 A 4	2881 D 3	3806 C 4	3878 B 2	9305 C 6
1202 C 6	2658 A 4	2890 B 3	3807 C 4	3879 A 3	9306 B 7
1203 C 5	2800 D 3	2891 E 4	3808 C 4	3880 E 3	9307 B 6
1204 C 5	2801 D 1	2892 D 4	3809 D 4	3881 C 1	9308 C 6
1250 D 7	2802 D 5	2893 E 4	3810 D 4	3882 D 1	9309 B 6
1301 C 6	2803 C 2	2895 B 5	3812 B 2	3883 C 4	9310 C 6
1302 E 5	2804 C 3	2896 B 6	3814 B 2	3884 E 1	9311 D 5
1350 C 7	2805 C 5	2901 A 7	3815 D 4	3885 D 1	9313 D 5
1601 A 5	2806 C 4	2903 A 7	3816 D 3	3886 D 3	9314 A 5
1626 A 4	2807 C 4	2906 A 7	3817 D 4	3887 C 3	9315 D 5
1800 A 6	2808 D 5	3207 A 2	3818 D 4	3888 C 3	9325 E 6
1801 A 6	2809 D 4	3208 A 2	3819 E 3	3889 C 3	9326 E 6
1809 E 1	2810 D 4	3209 A 2	3820 E 3	3890 B 2	9327 E 6
1810 E 1	2811 D 4	3300 B 7	3821 E 3	3891 E 3	9629 B 5
1811 D 3	2812 D 4	3301 B 7	3822 E 2	3892 E 4	9630 A 4
1812 A 1	2813 C 4	3302 B 7	3823 E 3	3893 B 2	9631 A 4
1901 C 2	2814 E 3	3303 B 7	3824 E 2	3894 A 2	9632 B 4
2248 C 5	2815 D 3	3304 B 7	3825 D 1	3895 D 4	9633 A 5
2249 C 6	2816 E 2	3305 E 7	3826 E 2	3896 E 4	9634 A 4
2250 C 5	2817 E 2	3306 E 7	3827 E 2	3897 E 4	9636 A 5
2251 D 6	2818 E 2	3307 E 7	3828 E 2	3898 E 5	9801 E 1
2252 A 1	2819 E 2	3308 E 7	3829 E 1	3899 B 1	9802 D 3
2253 A 1	2820 D 2	3309 D 6	3830 D 2	3901 A 7	9803 D 3
2274 B 4	2821 E 2	3310 C 6	3831 D 2	3907 C 2	9804 B 3
2301 B 7	2822 E 1	3311 C 7	3832 B 2	3908 C 2	9805 A 5
2302 B 7	2823 E 2	3313 E 5	3834 C 3	5201 A 2	9806 E 3
2303 C 7	2824 D 2	3314 E 5	3835 A 2	5625 B 6	9807 C 3
2304 C 7	2825 D 2	3315 B 7	3836 B 2	5801 E 3	9808 E 3
2305 C 7	2826 D 2	3316 B 6	3837 D 2	5803 C 4	9809 E 3
2306 D 7	2827 A 2	3351 A 2	3838 D 2	6250 C 5	9810 E 3
2307 D 7	2828 E 1	3352 A 2	3839 E 1	6251 C 5	9811 D 2
2308 D 7	2829 E 1	3353 A 2	3840 E 1	6252 D 6	9813 E 3
2309 E 7	2830 D 2	3354 A 2	3841 E 1	6253 C 5	9814 C 3
2310 E 7	2831 D 1	3625 A 5	3842 D 1	6256 A 3	9815 D 1
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2313 E 6	2834 D 5	3628 A 5	3845 D 4	6800 B 3	9818 C 3
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2315 D 6	2836 E 4	3630 B 5	3847 C 2	6802 B 1	9820 B 3
2317 D 6	2838 C 3	3631 A 5	3848 C 2	6803 B 2	9821 C 1
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2634 B 4	2854 D 3	3644 B 4	3861 B 3	7805 D 5	
2635 A 4	2855 C 3	3645 C 6	3862 B 3	7806 E 4	
2636 B 4	2856 D 3	3650 B 4	3863 B 3	7850 B 3	
2637 A 4	2857 D 2	3651 B 5	3864 A 3	7851 B 3	
2638 B 4	2858 C 2	3652 B 6	3865 A 3	7852 A 2	
2639 A 4	2859 D 4	3653 B 5	3866 E 4	7853 B 3	
2640 A 3	2860 A 3	3654 B 6	3867 E 5	7854 A 2	
2641 A 4	2861 B 3	3655 B 6	3868 E 5	7855 A 2	
2642 B 4	2871 B 2	3656 B 4	3869 E 4	7900 A 7	
2650 B 4	2872 A 2	3657 D 1	3870 B 2	7901 A 7	
2651 B 4	2873 B 2	3658 A 2	3871 B 2	9300 D 7	
2652 B 6	2874 C 1	3659 B 2	3872 A 6	9301 C 7	
2653 B 6	2875 A 2	3660 C 4	3873 A 6	9302 D 6	
2654 B 6	2876 C 1	3661 B 3	3874 C 3	9303 E 6	
2655 B 6	2880 D 3	3662 B 3	3877 B 2	9304 D 7	

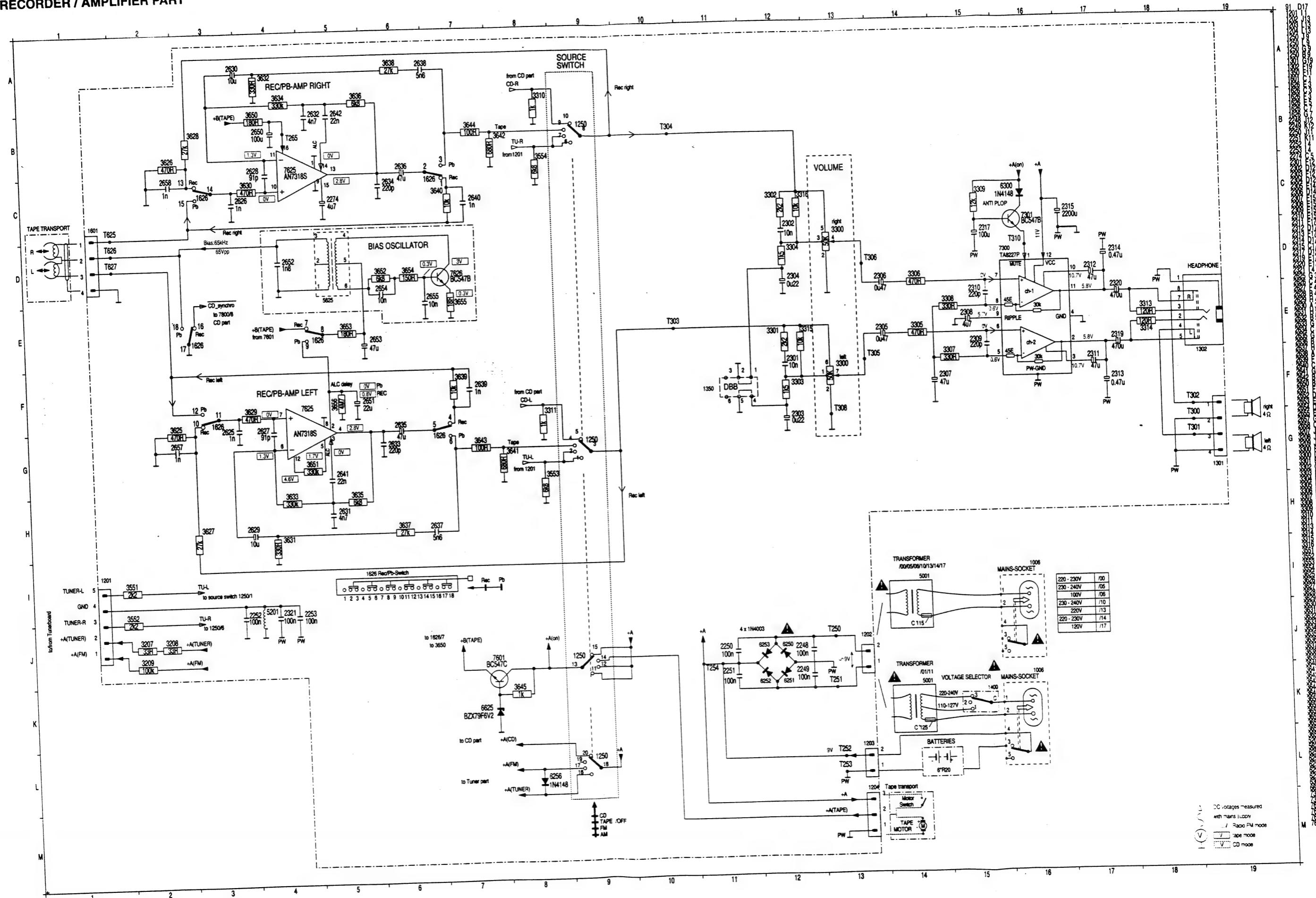
## FRONT BOARD - LAYOUT DIAGRAM



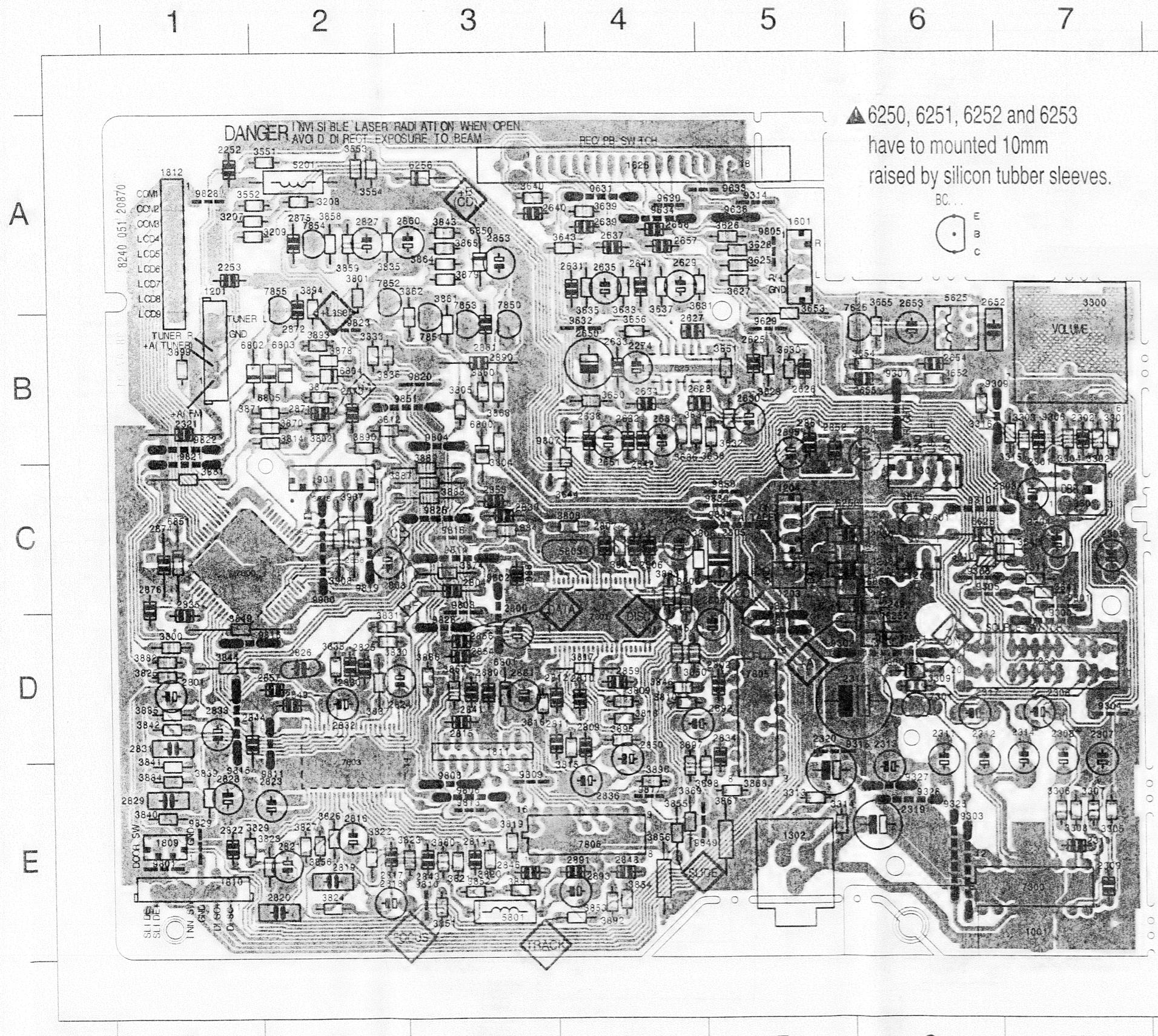
## COMBI BOARD AND FRONT BOARD - CIRCUIT DIAGRAM



## **COMBI BOARD - CIRCUIT DIAGRAM RECORDER / AMPLIFIER PART**



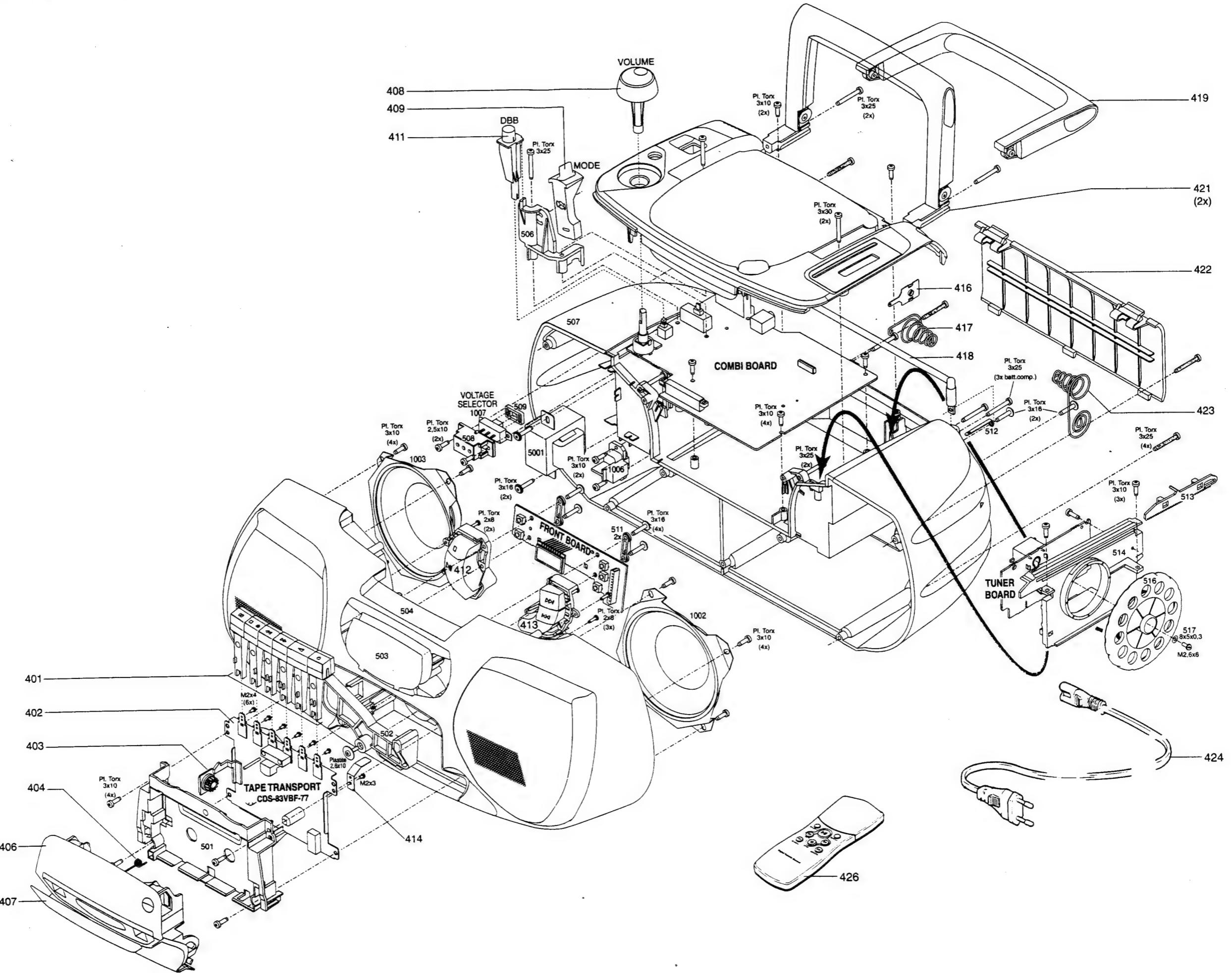
## COMBI BOARD - LAYOUT DIAGRAM



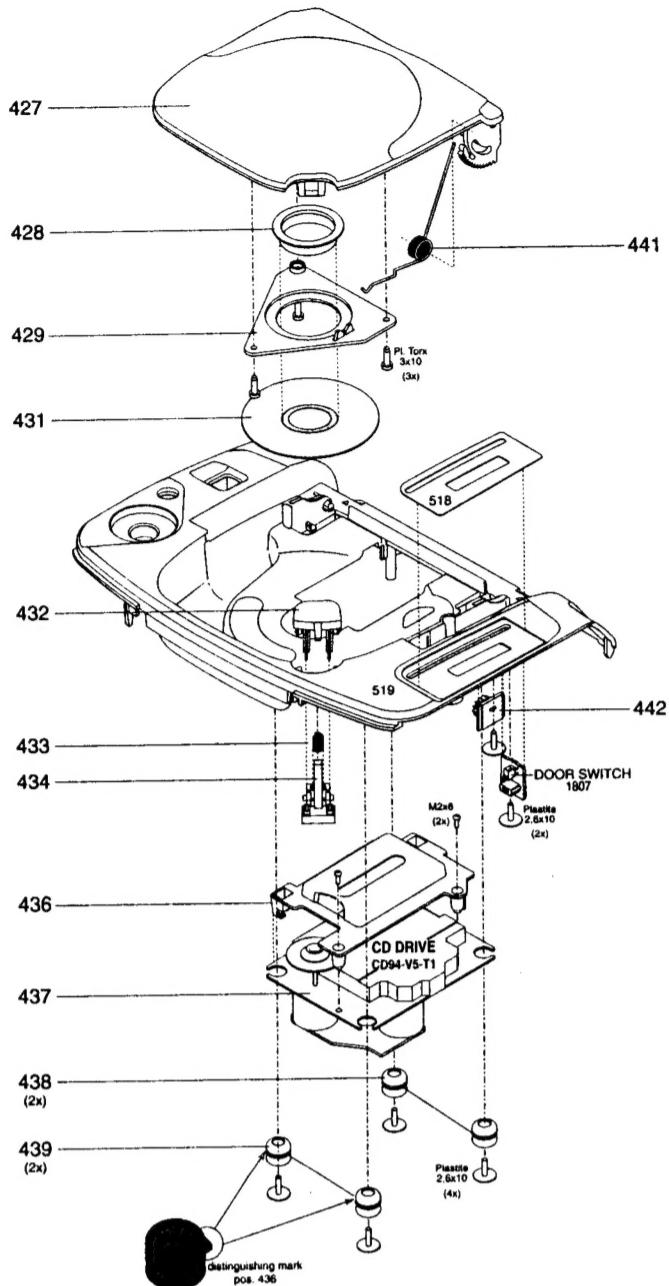
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1202 C 6	2658 A 4	2890 B 3	3807 C 4	3879 A 3	9306 B 7
1203 C 5	2800 D 3	2891 E 4	3808 C 4	3880 E 3	9307 B 6
1204 C 5	2801 D 1	2892 D 4	3809 D 4	3881 C 1	9308 C 6
1205 D 7	2802 D 5	2893 E 4	3810 D 4	3882 D 1	9309 B 6
1301 C 6	2803 C 2	2895 B 5	3812 B 2	3883 C 4	9310 C 6
1302 E 5	2804 C 3	2896 B 6	3814 B 2	3884 E 1	9311 D 5
1305 C 7	2805 C 5	2901 A 7	3815 D 4	3885 D 1	9313 D 5
1601 A 5	2806 C 4	2903 A 7	3816 D 3	3886 D 3	9314 A 5
1626 A 4	2807 C 4	2906 A 7	3817 D 4	3887 C 3	9315 D 5
1800 A 6	2808 D 5	3207 A 2	3818 D 4	3888 C 3	9325 E 6
1801 A 6	2809 D 4	3208 A 2	3819 E 3	3889 C 3	9326 E 6
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1812 A 1	2813 C 4	3302 B 7	3823 E 3	3893 B 2	9631 A 4
1901 C 2	2814 E 3	3303 B 7	3824 E 2	3894 A 2	9632 B 4
2248 C 5	2815 D 3	3304 B 7	3825 D 4	3895 D 4	9633 A 5
2249 C 6	2816 E 2	3305 E 7	3826 E 2	3896 E 4	9634 A 4
2250 C 5	2817 E 2	3306 E 7	3827 E 2	3897 E 4	9636 A 5
2251 D 6	2818 E 2	3307 E 7	3828 E 2	3898 E 5	9801 E 1
2252 A 1	2819 E 2	3308 E 7	3829 E 1	3899 B 1	9802 D 3
2253 A 1	2820 E 2	3309 D 6	3830 D 2	3901 A 7	9803 D 3
2274 B 4	2821 E 2	3310 C 6	3831 D 2	3907 C 2	9804 B 3
2301 B 7	2822 E 1	3311 C 7	3833 B 2	3908 C 2	9805 A 5
2302 B 7	2823 E 2	3313 E 5	3834 C 3	5201 A 2	9806 E 3
2303 C 7	2824 D 2	3314 E 5	3835 A 2	5625 B 6	9807 C 3
2304 C 7	2825 D 2	3315 B 7	3836 B 2	5801 E 3	9808 E 3
2305 C 7	2826 D 2	3316 B 6	3837 D 2	5803 C 4	9809 E 3
2306 D 7	2827 A 2	3551 A 2	3838 D 2	6250 C 5	9810 E 3
2307 D 7	2828 E 1	3552 A 2	3839 E 1	6251 C 5	9811 D 2
2308 D 7	2829 E 1	3553 A 2	3840 E 1	6252 D 6	9813 E 3
2309 E 7	2830 D 2	3554 A 2	3841 E 1	6253 C 5	9814 C 3
2310 E 7	2831 D 1	3625 A 5	3842 D 1	6256 A 3	9815 D 1
2311 E 6	2832 D 2	3626 A 5	3843 A 3	6300 D 6	9816 D 1
2312 E 6	2833 D 1	3627 A 5	3844 D 1	6625 C 6	9817 E 4
2313 E 6	2834 D 5	3628 A 5	3845 D 4	6800 B 3	9818 C 3
2314 D 7	2835 D 1	3629 B 5	3846 D 4	6801 D 3	9819 C 2
2315 D 6	2836 E 4	3630 B 5	3847 C 2	6802 B 1	9820 B 3
2317 D 6	2838 C 3	3631 A 5	3848 C 2	6803 B 2	9821 C 1
2319 E 6	2839 C 3	3632 B 5	3849 D 1	6804 B 2	9822 B 1
2320 E 5	2841 D 3	3633 A 4	3850 D 4	6805 B 2	9823 B 2
2321 B 1	2842 C 4	3634 B 4	3851 E 3	6850 A 3	9825 C 3
2625 B 5	2843 E 3	3635 A 4	3852 E 3	6851 C 1	9826 D 3
2626 B 5	2844 D 1	3636 B 4	3853 E 4	7300 E 7	9828 A 1
2627 B 4	2846 E 3	3637 A 4	3854 E 4	7301 D 6	9829 E 1
2628 B 4	2848 E 4	3638 B 5	3855 E 4	7601 C 6	9830 C 5
2629 A 4	2849 D 2	3639 A 4	3856 E 2	7625 B 4	9844 C 5
2630 B 5	2850 D 4	3640 A 3	3857 D 3	7626 B 6	9849 E 4
2631 A 4	2851 B 5	3641 C 7	3858 A 2	7800 C 1	9850 C 5
2632 B 4	2852 B 5	3642 C 7	3859 A 2	7801 D 4	9851 B 3
2633 B 4	2853 A 3	3643 A 4	3860 B 3	7803 D 2	9900 C 2
2634 B 4	2854 D 3	3644 B 4	3861 B 3	7805 D 5	
2635 A 4	2855 C 3	3645 C 6	3862 B 3	7806 E 4	
2636 B 4	2856 D 3	3650 B 4	3863 B 3	7850 B 3	
2637 A 4	2857 D 2	3651 B 5	3864 A 3	7851 B 3	
2638 B 4	2858 C 2	3652 B 6	3865 A 3	7852 A 2	
2639 A 4	2859 D 4	3653 B 5	3866 E 4	7853 B 3	
2640 A 3	2860 A 3	3654 B 6	3867 E 5	7854 A 2	
2641 A 4	2861 B 3	3655 B 6	3868 E 5	7855 A 2	
2642 B 4	2871 B 2	3656 B 4	3869 E 4	7900 A 7	
2650 B 4	2872 A 2	3800 D 1	3870 B 2	7901 A 7	
2651 B 4	2873 B 2	3801 A 2	3871 B 2	9300 D 7	
2652 B 6	2874 C 1	3802 B 2	3872 A 6	9301 C 7	
2653 B 6	2875 A 2	3803 C 4	3873 A 6	9302 D 6	
2654 B 6	2876 C 1	3804 B 3	3874 C 3	9303 E 6	
2655 B 6	2880 D 3	3805 B 3	3877 B 2	9304 D 7	

1 2 3 4 5 6 7

## **EXPLODED VIEW DIAGRAM - CABINET**



## EXPLODED VIEW DIAGRAM - CD



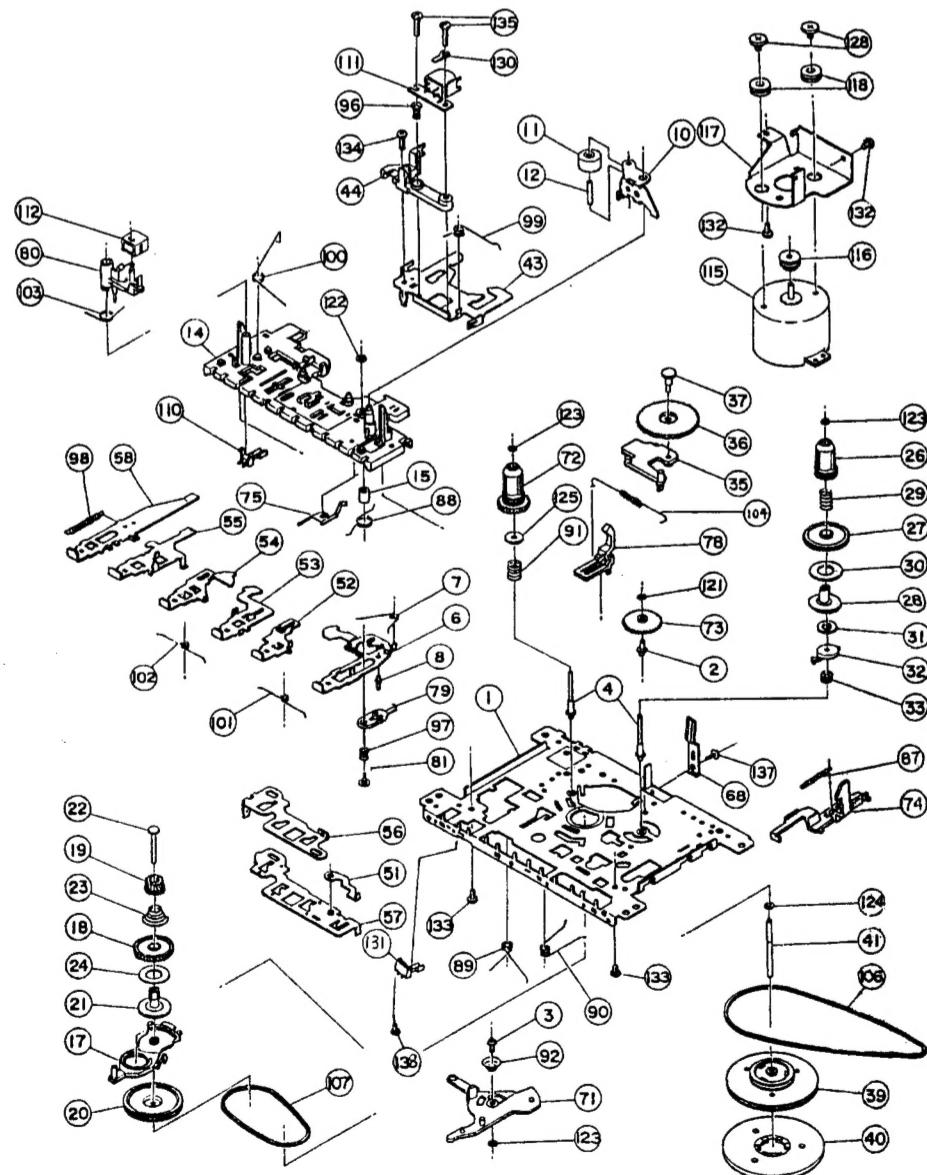
## MECHANICAL PARTSLIST

401	4822 410 12273	Key Set Cassette
402	4822 691 10612	Shinwa CDS-83VBF-77
403	4822 529 10322	Damper Assy
404	4822 492 42709	Spring Door
406	4822 443 11152	Door Cassette
407	4822 381 12032	Lens Cassette
408	4822 410 11404	Knob Volume
409	4822 410 11406	Knob Mode
411	4822 410 11405	Knob DBB
412	4822 410 12269	Button Set CD1
413	4822 410 12271	Button Set CD2
414	4822 492 11061	Spring Recording
416	4822 290 80313	Contact Plate
417	4822 492 51961	Spring Compression
418	4822 303 14038	Telescopic Aerial
419	4822 498 10726	Handle
421	4822 402 11273	Bracket Handle
422	4822 442 01662	Door Battery
423	4822 492 51733	Spring Compression
424	4822 321 10249	Mains Cord (Not for -/17)
424	4822 321 11466	Mains Cord (For -/17)
426	4822 219 10665	Remote RC330801/01
426	4822 219 10664	Remote RC330801/04
427	4822 443 10819	Door CD
428	4822 532 12798	Ring Pressure
429	4822 402 61508	Bracket CD
431	4822 535 60096	Disc
432	4822 410 11507	Knob Eject CD
433	4822 492 11058	Spring Eject
434	4822 402 10723	Lever Eject
436	4822 442 01096	Cover CD
437	4822 691 10654	CD Drive CD94V5T1
438	4822 529 10386	Damper Rubber (30 DEG)
439	4822 529 10387	Damper Rubber (40 DEG)
441	4822 492 11718	Spring CD
442	4822 529 10322	Damper Assy
	4822 256 90463	Holder Ferrite Bar
	4822 736 16714	Instruction manual (For -/00)
	4822 736 16708	Instruction manual (For -/01)
	4822 736 16707	Instruction manual (For -/14)
	4822 736 16712	Instruction manual (For -/17)

Note : Only those parts mentioned in the list are normal service parts.

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## EXPLODED VIEW DIAGRAM - TAPE DECK



## MECHANICAL PARTSLIST - TAPE DECK

10	4822 528 70849	Pinch Roller Arm (B)
11	4822 528 70695	Pinch Roller Assy
74	4822 403 70968	Eject Hook (A)
106	4822 358 31325	Main Belt 45.2 x 1.2
107	4822 358 31124	Sub Belt 44.7 x 1.2
110	4822 278 90721	Leaf Switch
111	4822 249 30218	MS18R-AKONI
112	4822 249 40306	E. Head
115	4822 361 21565	Motor EG-530AD-9B
116	4822 528 81497	Motor Pulley
	4822 691 10612	Shinwa CDS-83VBF-77

Note : Only those parts mentioned in the list are normal service parts.

## ELECTRICAL PRTSLIST

II						
2101	4822 122 33195	100pF	10%	50V		
2102	4822 122 33848	47pF	5%SL	50V		
2103	4822 124 41579	10µF	20%	50V		
2104	4822 124 41579	10µF	20%	50V		
2105	4822 122 33191	22pF	5%	50V		
2106	4822 125 50681	Variable Cap				
2108	4822 122 10465	4,7pF	10%	50V		
2109	4822 126 14482	27pF	5%	50V N470		
2110	4822 126 12229	8,2pF	N750	50V		
2112	4822 124 40433	47µF	20%	25V		
2113	4822 126 13581	0,22µF	20%	50V		
2114	4822 126 12787	330pF	10%	Y5V 50V		
2115	4822 124 40246	4,7µF	20%	63V		
2116	4822 121 70619	22nF	10%	50V		
2116	4822 121 43145	33nF	10%	50V		
2117	4822 124 40242	1µF	20%	63V		
2118	4822 124 40242	1µF	20%	63V		
2119	4822 121 70619	22nF	10%	50V		
2119	4822 121 43145	33nF	10%	50V		
2120	4822 124 40242	1µF	20%	63V		
2121	4822 124 41407	0,47µF	20%	63V		
2122	4822 124 41407	0,47µF	20%	63V		
2248	5322 121 42386	100nF	5%	63V		
2249	5322 121 42386	100nF	5%	63V		
2250	5322 121 42386	100nF	5%	63V		
2251	5322 121 42386	100nF	5%	63V		
2252	4822 126 12882	100nF	+80-20%	50V		
2253	4822 126 12882	100nF	+80-20%	50V		
2274	4822 124 40246	4,7µF	20%	63V		
2301	4822 121 51387	10nF	20%	16V		
2302	4822 121 51387	10nF	20%	16V		
2303	4822 126 13581	0,22µF	20%	50V		
2304	4822 126 13581	0,22µF	20%	50V		
2305	4822 124 41407	0,47µF	20%	63V		
2306	4822 124 41407	0,47µF	20%	63V		
2307	4822 124 40433	47µF	20%	25V		
2308	4822 124 40246	4,7µF	20%	63V		
2309	4822 122 10466	220pF	10%	50V		
2310	4822 122 10466	220pF	10%	50V		
2311	4822 124 40433	47µF	20%	25V		

II						
2312	4822 124 40433	47µF	20%	25V		
2313	4822 124 41407	0,47µF	20%	63V		
2314	4822 124 41407	0,47µF	20%	63V		
2315	4822 123 14025	220µF	20%	16V		
2317	4822 124 81029	100µF	20%	25V		
2319	4822 124 80195	470µF	20%	10V		
2320	4822 124 80195	470µF	20%	10V		
2321	4822 126 12882	100nF	+80-20%	50V		
2625	4822 122 33197	1nF	10%	50V		
2626	4822 122 33197	1nF	10%	50V		
2627	4822 126 13507	91pF	5%	50V		
2628	4822 126 13507	91pF	5%	50V		
2629	4822 124 41579	10µF	20%	50V		
2630	4822 124 41579	10µF	20%	50V		
2631	4822 121 10686	4,7nF	10%	50V		
2632	4822 121 10686	4,7nF	10%	50V		
2633	4822 122 10466	220pF	10%	50V		
2634	4822 122 10466	220pF	10%	50V		
2635	4822 124 40433	47µF	20%	25V		
2636	4822 124 40433	47µF	20%	25V		
2637	4822 121 42469	5,6nF	5%	250V		
2638	4822 121 42469	5,6nF	5%	250V		
2639	4822 122 33197	1nF	10%	50V		
2640	4822 122 33197	1nF	10%	50V		
2641	4822 126 11585	22nF	+80-20%	Y5V 25V		
2642	4822 126 11585	22nF	+80-20%	Y5V 25V		
2650	4822 124 41584	100µF	20%	10V		
2651	4822 124 81151	22µF	50V			
2652	4822 121 10685	1,8nF	10%	50V		
2653	4822 124 40433	47µF	20%	25V		
2654	4822 121 51387	10nF	20%	16V		
2655	4822 121 51387	10nF	20%	16V		
2657	4822 122 33197	1nF	10%	50V		
2658	4822 122 33197	1nF	10%	50V		
2800	4822 124 40242	1µF	20%	63V		
2801	4822 124 40242	1µF	20%	63V		
2802	4822 121 51387	10nF	20%	16V		
2803	4822 124 23432	100µF	20%	10V		
2804	4822 126 12878	1,5nF	10%	16V		
2805	4822 121 42408	220nF	5%	63V		

## ELECTRICAL PARTSLIST

II						
2806	4822 126 14316	680pF	10%	50V Y5P		
2807	4822 122 33191	22pF	5%	50V		
2808	4822 124 40433	47µF	20%	25V		
2809	4822 122 10459	560pF	10%	50V		
2810	4822 122 10459	560pF	10%	50V		
2811	4822 126 12702	270pF	10%	Y5P 50V		
2812	4822 126 12702	270pF	10%	Y5P 50V		
2813	4822 126 12339	2,2nF	10%	Y5R		
2814	4822 126 13677	39pF	5%	50V		
2815	4822 121 51387	10nF	20%	16V		
2816	4822 124 41407	0,47µF	20%	63V		
2817	4822 122 10577	3,3nF	10%	16V		
2818	4822 124 40242	1µF	20%	63V		
2819	5322 121 42386	100nF	5%	63V		
2821	4822 124 41579	10µF	20%	50V		
2822	4822 126 11585	22nF	+80-20%	Y5V 25V		
2823	4822 124 40246	4,7µF	20%	63V		
2824	4822 124 41407	0,47µF	20%	63V		
2825	4822 122 10462	15pF	5%	NP0		
2826	4822 121 51252	470nF	5%	63V		
2827	4822 124 40433	47µF	20%	25V		
2828	4822 124 41579	10µF	20%	50V		
2829	4822 121 43145	33nF	10%	50V		
2830	4822 122 10319	82pF	5%	50V		
2831	4822 121 70619	22nF	10%	50V		
2832	4822 124 41576	2,2µF	20%	50V		
2833	4822 124 40433	47µF	20%	25V		
2834	4822 126 12882	100nF	+80-20%	50V		
2835	4822 122 33195	100pF	10%	50V		
2836	4822 124 40433	47µF	20%	25V		
2838	4822 122 33197	1nF	10%	50V		
2839	4822 122 33191	22pF	5%	50V		
2841	4822 126 13677	39pF	5%	50V		
2842	4822 124 40433	47µF	20%	25V		
2843	4822 126 13098	5,6nF	20%	16V		
2844	4822 122 33195	100pF	10%	50V		
2846	4822 122 33197	1nF	10%	50V		
2848	4822 122 33197	1nF	10%	50V		
2849	4822 122 33195	100pF	10%	50V		
2850	4822 124 41579	10µF	20%	50V		
3101	4822 100 20167	50K	30%	LIN 0,1W		
3102	4822 116 52297	68K	5%	0,5W		
3104	4822 116 52256	2K2	5%	0,5W		
3106	4822 116 52231	820R	5%	0,5W		
3107	4822 116 52191	33R	5%	0,5W		
3113	4822 116 52234	100K	5%	0,5W		
3114	4822 116 52234	100K	5%	0,5W		
3207	4822 116 52191	33R	5%	0,5W		
3208	4822 116 52191	33R	5%	0,5W		
3209	4822 116 52234	100K	5%	0,5W		

## ELECTRICAL PARTSLIST

						
3300	4822 101 11826	50K	20%	LIN	0,025W	
3301	4822 116 52256	2K2	5%	0,5W		
3302	4822 116 52256	2K2	5%	0,5W		
3303	4822 116 52243	1K5	5%	0,5W		
3304	4822 116 52243	1K5	5%	0,5W		
3305	4822 116 83883	470R	5%	0,5W		
3306	4822 116 83883	470R	5%	0,5W		
3307	4822 116 52219	330R	5%	0,5W		
3308	4822 116 52219	330R	5%	0,5W		
3309	4822 116 52238	12K	5%	0,5W		
3310	4822 050 11002	1K	1%	0,4W		
3311	4822 050 11002	1K	1%	0,4W		
3313	4822 116 52206	120R	5%	0,5W		
3314	4822 116 52206	120R	5%	0,5W		
3315	4822 116 83864	10K	5%	0,5W		
3316	4822 116 83864	10K	5%	0,5W		
3551	4822 116 52256	2K2	5%	0,5W		
3552	4822 116 52256	2K2	5%	0,5W		
3553	4822 116 83961	6K8	5%			
3554	4822 116 83961	6K8	5%			
3625	4822 116 83883	470R	5%	0,5W		
3626	4822 116 83883	470R	5%	0,5W		
3627	4822 116 52264	27K	5%	0,5W		
3628	4822 116 52264	27K	5%	0,5W		
3629	4822 116 83883	470R	5%	0,5W		
3630	4822 116 83883	470R	5%	0,5W		
3631	4822 116 52219	330R	5%	0,5W		
3632	4822 116 52219	330R	5%	0,5W		
3633	4822 116 52272	330K	5%	0,5W		
3634	4822 116 52272	330K	5%	0,5W		
3635	4822 116 83961	6K8	5%			
3636	4822 116 83961	6K8	5%			
3637	4822 116 52264	27K	5%	0,5W		
3638	4822 116 52264	27K	5%	0,5W		
3639	4822 116 83864	10K	5%	0,5W		
3640	4822 116 83864	10K	5%	0,5W		
3641	4822 116 52228	680R	5%	0,5W		
3642	4822 116 52228	680R	5%	0,5W		
3643	4822 116 52175	100R	5%	0,5W		
3644	4822 116 52175	100R	5%	0,5W		

						
3645	4822 050 11002	1K	1%	0,4W		
3650	4822 116 52213	180R	5%	0,5W		
3651	4822 116 52272	330K	5%	0,5W		
3652	4822 116 83961	6K8	5%			
3653	4822 116 52213	180R	5%	0,5W		
3654	4822 116 83868	150R	5%	0,5W		
3655	4822 116 52184	18R	5%	0,5W		
3656	4822 111 30893	4M7	5%	0,2W		
3800	4822 116 52176	10R	5%	0,5W		
3801	4822 050 24708	4R7	1%	0,6W		
3802	4822 116 83868	150R	5%	0,5W		
3803	4822 116 52219	330R	5%	0,5W		
3804	4822 116 52206	120R	5%	0,5W		
3805	4822 116 83872	220R	5%	0,5W		
3806	4822 116 52249	1K8	5%	0,5W		
3807	4822 116 52271	33K	5%	0,5W		
3808	4822 116 52263	2K7	5%	0,5W		
3809	4822 116 52276	3K9	5%	0,5W		
3810	4822 116 52303	8K2	5%	0,5W		
3812	4822 116 52257	22K	5%	0,5W		
3814	4822 116 52257	22K	5%	0,5W		
3815	4822 116 52264	27K	5%	0,5W		
3816	4822 116 52264	27K	5%	0,5W		
3817	4822 116 52234	100K	5%	0,5W		
3818	4822 050 11002	1K	1%	0,4W		
3819	4822 117 11825	1M5	5%			
3820	4822 116 52252	180K	5%	0,5W		
3821	4822 116 52243	1K5	5%	0,5W		
3822	4822 116 52264	27K	5%	0,5W		
3823	4822 116 52234	100K	5%	0,5W		
3824	4822 116 83868	150R	5%	0,5W		
3825	4822 116 83883	470R	5%	0,5W		
3826	4822 116 83961	6K8	5%			
3827	4822 116 52269	3K3	5%	0,5W		
3828	4822 116 52251	18K	5%	0,5W		
3829	4822 116 83884	47K	5%	0,5W		
3830	4822 116 52244	15K	5%	0,5W		
3831	4822 116 52251	18K	5%	0,5W		
3832	4822 116 52264	27K	5%	0,5W		
3833	4822 116 52175	100R	5%	0,5W		
3834	4822 116 52175	100R	5%	0,5W		

## ELECTRICAL PARTSLIST

						
3835	4822 116 52184	18R	5%	0,5W		
3836	4822 050 11002	1K	1%	0,4W		
3837	4822 111 30893	4M7	5%	0,2W		
3838	4822 116 52234	100K	5%	0,5W		
3839	4822 116 52298	680K	5%	0,5W		
3840	4822 050 11002	1K	1%	0,4W		
3841	4822 116 52285	470K	5%	0,5W		
3842	4822 116 52297	68K	5%	0,5W		
3843	4822 116 83881	390R	5%	0,5W		
3844	4822 116 52291	56K	5%	0,5W		
3845	4822 116 52297	68K	5%	0,5W		
3846	4822 050 11002	1K	1%	0,4W		
3847	4822 051 20223	22K	5%	0,1W		
3848	4822 051 20223	22K	5%	0,1W		
3849	4822 116 52175	100R	5%	0,5W		
3850	4822 116 52283	4K7	5%	0,5W		
3851	4822 116 83864	10K	5%	0,5W		
3852	4822 116 83883	470R	5%	0,5W		
3853	4822 116 52244	15K	5%	0,5W		
3854	4822 116 52243	1K5	5%	0,5W		
3855	4822 116 52271	33K	5%	0,5W		
3856	4822 116 52303	8K2	5%	0,5W		
3857	4822 116 52269	3K3	5%	0,5W		
3858	4822 116 80176	1R	5%	0,5W		
3859	4822 116 83864	10K	5%	0,5W		
3860	4822 117 12798	8R2	5%	0,25W		
3861	4822 117 12798	8R2	5%	0,25W		
3862	4822 116 52269	3K3	5%	0,5W		
3863	4822 116 52219	330R	5%	0,5W		
3864	4822 116 52256	2K2	5%	0,5W		
3865	4822 116 52256	2K2	5%	0,5W		
3866	4822 052 10828	8R2	5%	0,33W		
3867	4822 052 10338	3R3	5%	0,33W		
3868	4822 116 80176	1R	5%	0,5W		
3869	4822 116 83883	470R	5%	0,5W		
3870	4822 116 52257	22K	5%	0,5W		
3871	4822 050 11002	1K	1%	0,4W		
3872	4822 051 20393	39K	5%	0,1W		
3873	4822 051 20223	22K	5%	0,1W		
3874	4822 116 83872	220R	5%	0,5W		

						
5101	4822 157 70513	Coil	FM			
5102	4822 157 70731	Coil	MW/ANT			
5104	4822 157 11843	Coil	MD7B-01F			
5105	4822 157 71145	Coil	270µH			
5106	4822 157 70499	Coil	IFT AM			

## ELECTRICAL PARTSLIST

5107	4822 242 81154	KMFC5058-Z
5108	4822 156 11146	Coil IFT AM
5201	4822 157 70826	Coil 2,4 $\mu$ H
5625	4822 157 10371	Coil Var 100kHz
5801	4822 157 70826	Coil 2,4 $\mu$ H
5803	4822 242 73557	Filter CST8,46MTW-TF01
6101	4822 130 30621	Diode 1N4148
6102	4822 130 30621	Diode 1N4148
6250	4822 130 31878	Diode 1N4003G
6251	4822 130 31878	Diode 1N4003G
6252	4822 130 31878	Diode 1N4003G
6253	4822 130 31878	Diode 1N4003G
6256	4822 130 30621	Diode 1N4148
6300	4822 130 30621	Diode 1N4148
6625	4822 130 34167	Diode BZX79-B6V2
6800	4822 130 31881	Diode BZX79-B3V0
6801	4822 130 31881	Diode BZX79-B3V0
6802	4822 130 30621	Diode 1N4148
6803	4822 130 30621	Diode 1N4148
6804	4822 130 30621	Diode 1N4148
6805	4822 130 31981	Diode BZX79-B3V9
6850	4822 130 31881	Diode BZX79-B3V0
6851	5322 130 34834	Diode BZX79-C3V6
7101	4822 209 32746	IC TEA5711T/N2
7102	4822 130 44503	Trans BC547C
7300	4822 209 31544	IC TA8227P
7301	4822 130 40959	Trans BC547B
7601	4822 130 44503	Trans BC547C
7625	4822 209 32918	IC AN7318S
7626	4822 130 40959	Trans BC547B
7800	4822 209 17363	IC TMP47C422F
7801	4822 209 16076	IC M65824FP/ES5.0
7803	4822 209 90496	IC M62475FP

7805	4822 209 32852	IC TDA7073A/N2
7806	4822 209 32852	IC TDA7073A/N2
7850	4822 130 41327	Trans BC327-40
7851	4822 130 44568	Trans BC557B
7852	4822 130 41327	Trans BC327-40
7853	4822 130 44503	Trans BC547C
7854	4822 130 42231	Trans BC557C
7855	4822 130 44503	Trans BC547C
7900	4822 130 10165	Receiver GP1U28XP
7901	5322 209 11147	IC HEF4093BT
<b>- MISCELLANEOUS -</b>		
1002	4822 240 10254	Loudspeaker
1003	4822 240 10254	Loudspeaker
1004	4822 691 10612	Shinwa CDS-83VBF-77
1005	4822 691 10654	CD Drive CD94V5T1
1006	4822 265 20318	Socket Main (Note for -/17)
1006	4822 265 20706	Socket Main (For -/17)
1007	4822 277 21794	Voltage Selector (For -/01)
1102	4822 526 10176	Ferrite Bar 5x13x55mm
1250	4822 277 11739	Slide Switch
1302	4822 265 11317	Connector
1350	4822 276 12648	Push Switch
1626	4822 277 11504	Slide Switch
1800	4822 276 13114	Tact Switch
1801	4822 276 13114	Tact Switch
1802	4822 276 13114	Tact Switch
1803	4822 276 13114	Tact Switch
1804	4822 276 13114	Tact Switch
1807	4822 276 12889	Door Switch
1820	4822 135 00151	LCD Display
5001	4822 146 11118	Transformer (For -/00/14)
5001	4822 146 10877	Transformer (For -/01)
5001	4822 146 10876	Transformer (For -/17)
8003	4822 320 12637	Flexible Foil Connection

Note : Only those parts mentioned in the list are normal service parts.